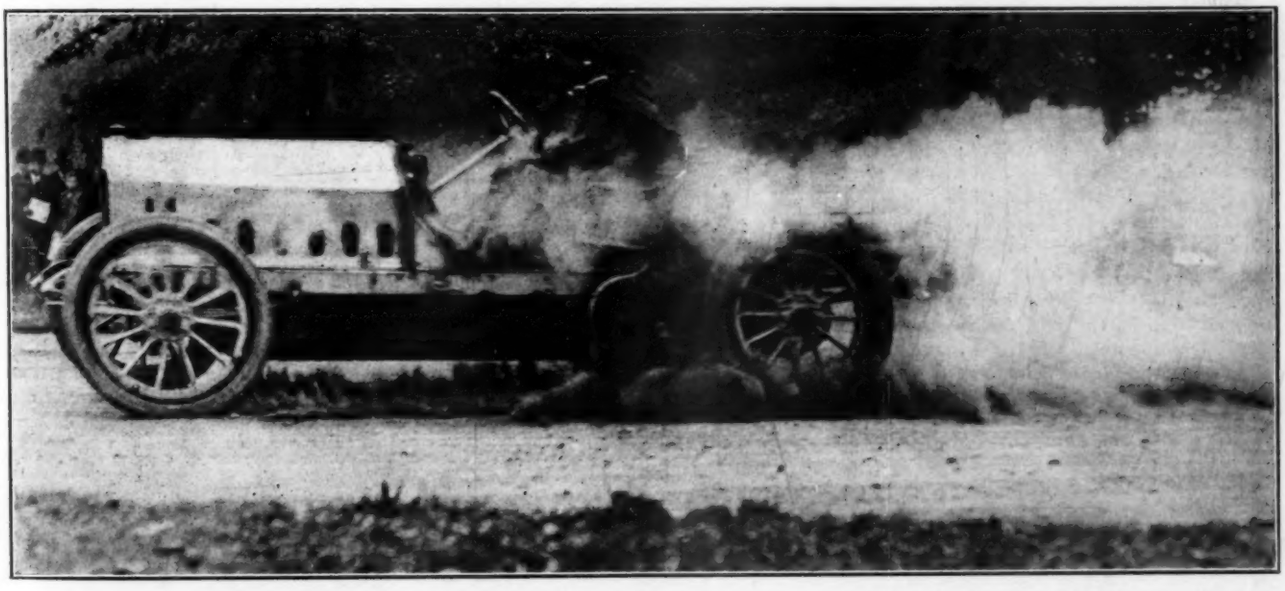
THE AUTOMOBILE

THE OTHER HALF OF THE AUTOMOBILE

GENERALLY speaking, a medium for transportation comprises a vehicle and the track on which it rolls. Referring to a train of cars as drawn by a locomotive, it is a self-evident fact that the roadbed and the rails constitute a very essential proportion of the system. In railroad work, service is improved in proportion to the advances made in the qualities of the roadbed and the rails. Improving the trackage improves the service, and when it was found that locomotives had substantially reached the limit in response to human ingenuity and activity, further headway was obtained by increasing the weight of the rails per unit of length, and improving the qualities of the ballast used on the roadbed.

Likewise, in considering an automobile, the practical performance of the car will depend upon the degree of perfection of the roadbed. In a sense, increasing the utility of the automobile may be accomplished in one of two ways, i. e., adding to the roadability of the car, or improving the road. In view of these considerations, it is not far-fetched to point out that the roadbed is the other half of the automobile, so to speak.



RACING SCENE SHOWING HOW CARS AT HIGH SPEED TEAR UP THE ROAD SURFACE

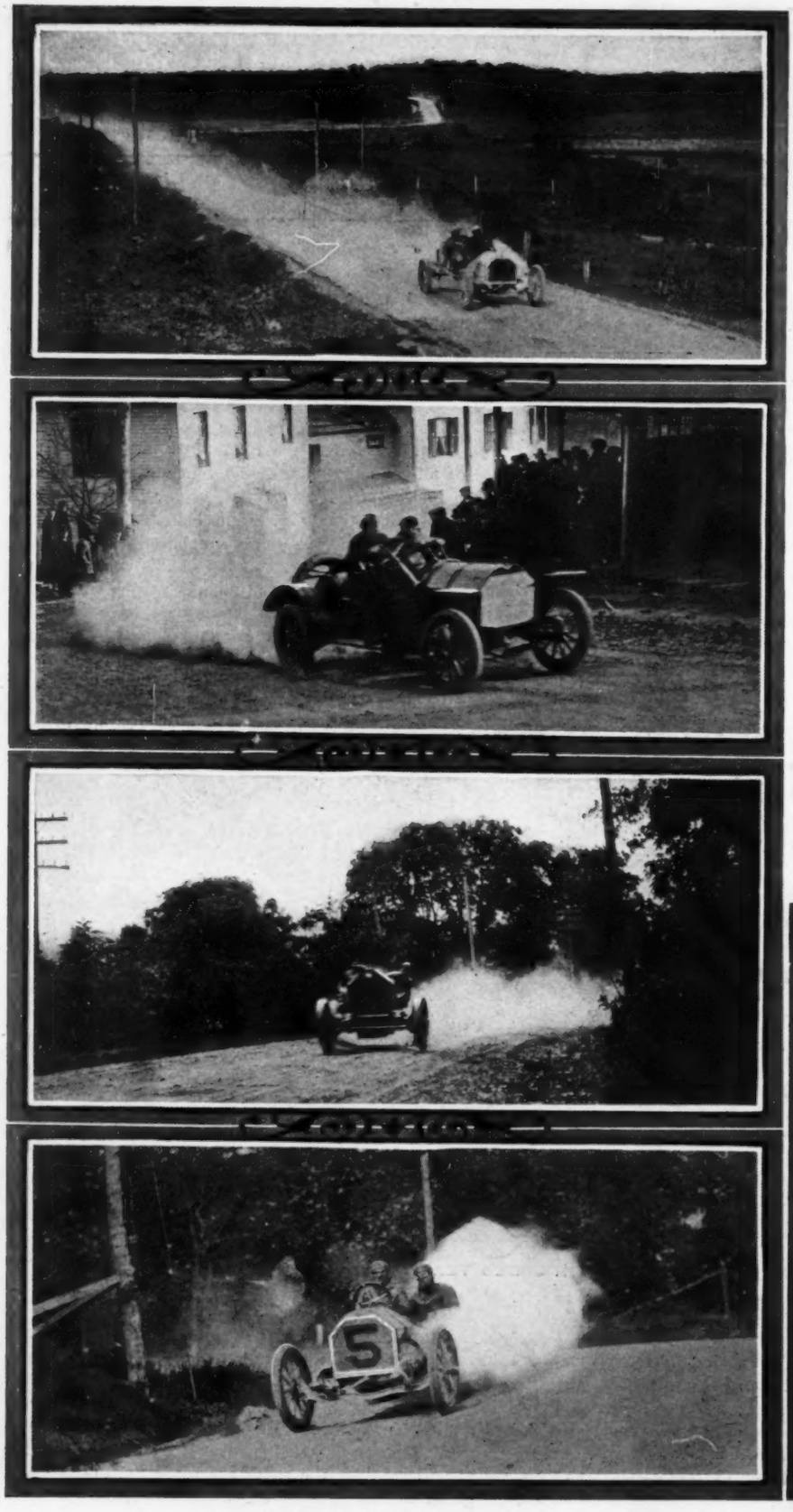
Since the roadbed serves for a large number of the machinery components, wisdom would seem to indicate that it should be improved at any cost. Trying to make machines (automobiles) so that they will render good service on bad roads is an undertaking which violates every principle of national economy. It is perfectly foolish to suppose that the public at large may avoid paying for the extra work which will have to be put upon the automobiles to make them render efficient service on inefficient roads.

If it is assumed that automobiles (the machinery portion) can be built for $1 per pound, it may at once be said that the roadbed will cost but a minor proportion of this price per pound. The machinery portion is only available for one specific utility purpose, but, as before stated, the roadbed is available for the common use of all the automobiles. To sum up from this point of view, the public at large, who must pay for the automobiles and the roads on which they run, might better settle for good roads than to pay $1 per pound for automobiles.

If there are 300,000 automobiles running in this country at the present time, and if they weigh 2,000 pounds apiece, taking this as an average figure, the public at large must have expended $600,000,000 in the purchase of the automobiles. There are numerous important considerations which do not come out in the mere statement of the purchase price of a given number of automobiles. If the depreciation due to roads as they obtain at the present time is equal to 20 per cent. the public at large must pay $120,000,000 per year in the maintenance of 300,000 automobiles.

Improving the road has the effect of decreasing the first cost of the cars, and the further effect of decreasing the cost of maintenance thereof. It is useless to go into figures to express the savings which will result if the roads are made uniformly good, but the situation as here presented, while it fails to tell the whole story, very clearly indicates the advisability of improving the roads in order to save money on the whole.

The discussion may be advanced to a high economic phase in the simple process of pointing out that in the transportation of goods, if time can be saved, a saving of money will result also. If money is worth 6 per cent. per annum, and it must be, since



A NUMBER OF RACING SCENES, ALSO SHOWING THE DESTRUCTIVE ACTION

Top, Scene in Cobe Cup Race in Indiana, Showing the Trail of Road Top Dressing
Simplex Racing Car "Eating" off the Road Surface at an Abrupt or 90 Degree Turn
Huge Chadwick Racing Car in a Hill-Climb, Showing How Speed Is Detrimental to Roads
Skidding Around Abrupt Turns Does Much Lasting Damage to Top of the Road Surfaces
Bottom, at the Right, View of Bad Road Before Improvement Was the Order of the Day

most of us will take all we can get at that price, a saving of money will result if goods are transported at a saving of time. Goods tied up on the road represent money drawing interest; lowering the tie-up time reduces the interest charge.

There are secondary phases to this same situation. If the delivery of merchandise is delayed, opportunity for its proper disposition will be lost. Failure to conform to a delivery contract indicates failure of the whole undertaking, whatever it may be, since little or nothing can be done until the merchandise is delivered. In this way, all along the line, speedy and inexpensive methods of transportation provoke additional advantage, and in counting an advantage it becomes necessary to account for the loss, if the advantage is neglected.

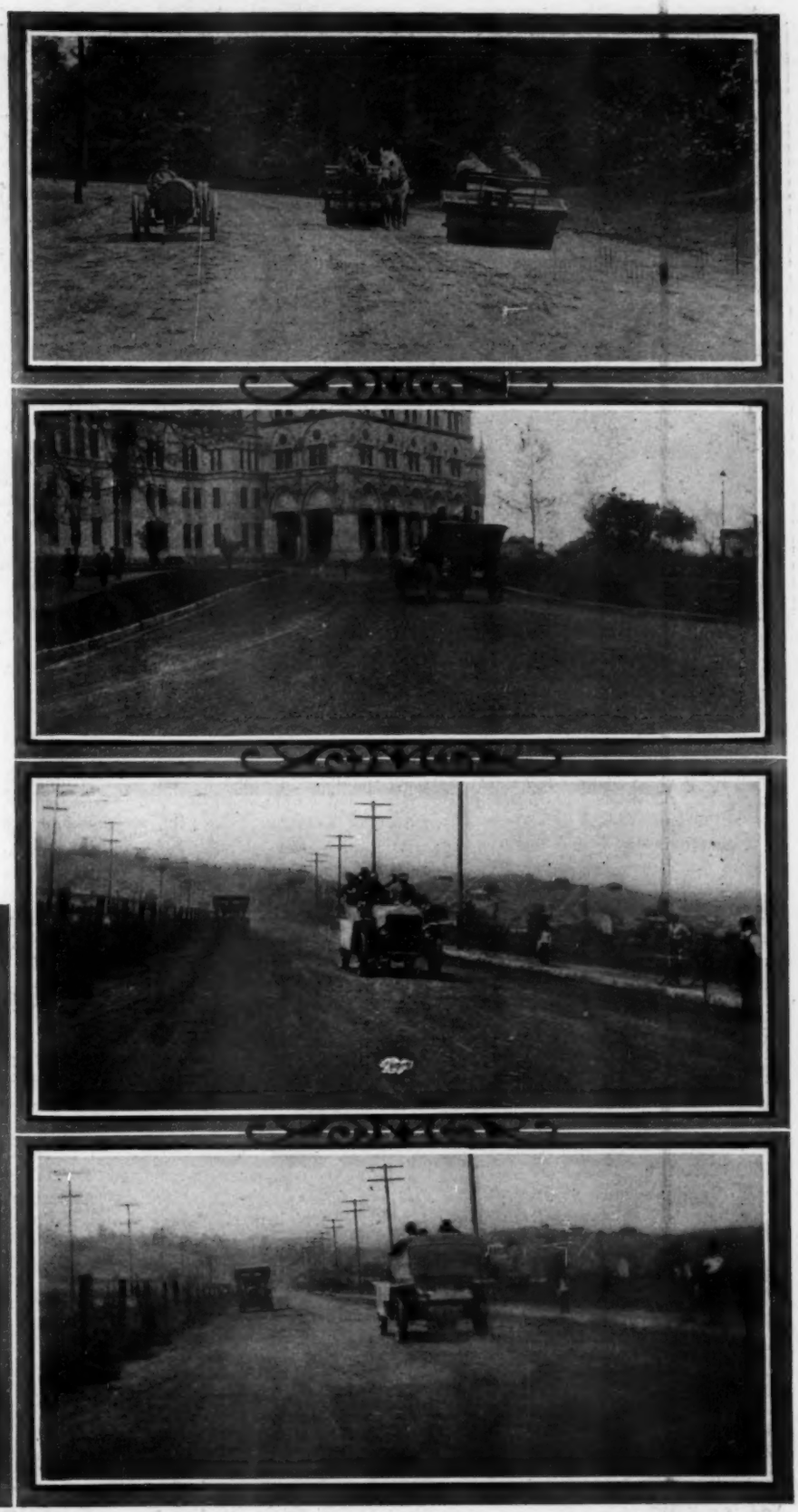
It is extremely difficult to bring the citizen at large to a proper realization of the fact that a commodity is at his expense, even though it may be purchased and paid for by his neighbor. An automobile is a luxury in the service of a class, according to the average citizen, if he does not own one, and a certain prejudice is prone to interfere with the process of normal thinking under the circumstances. Let it be taken for granted that the owner of the car in any given case realizes the direct result, but this fact in itself does not fix the character of the service, which in the ordinary course, may be efficient or

otherwise according to circumstances.

Indirectly, the service, if it is advantageous, becomes so for every one, or if it is inefficient, levies tribute from all. Broadly speaking, then, it is the duty of every citizen to wisely provide for the roads which will help in the process of transporting merchandise, and thereby reduce the total cost of the service as rendered, in order that the proportion of cost, a percentage of which is bound to fall upon every citizen, will be minimized.

Since the roadbed serves in common for all the automobiles available for use, it is ample indication of the necessity for doing the best possible work in its construction. An inferior road will induce excessive depreciation in a superior car, but it must be perfectly plain that even a well-built road is likely to suffer from the severe service to which it falls heir in view of its common use by all automobiles.

The front page illustration shows a racing car on a macadam road, and as a result of the superior ability of the car and the inferiority of the road, its performance denotes rapid deterioration, which is evinced by the cloud of dust raised. Contrary to the statements which are frequently made, even the front wheels pick up the top dressing of an inferior road when the speed of a car is high, although, as the illustration further portrays, the rear wheels have the most marked effect, which is no



HOW ROADS ARE IMPROVED AND THE GOOD RESULTS OBTAINED FROM THEIR IMPROVEMENT

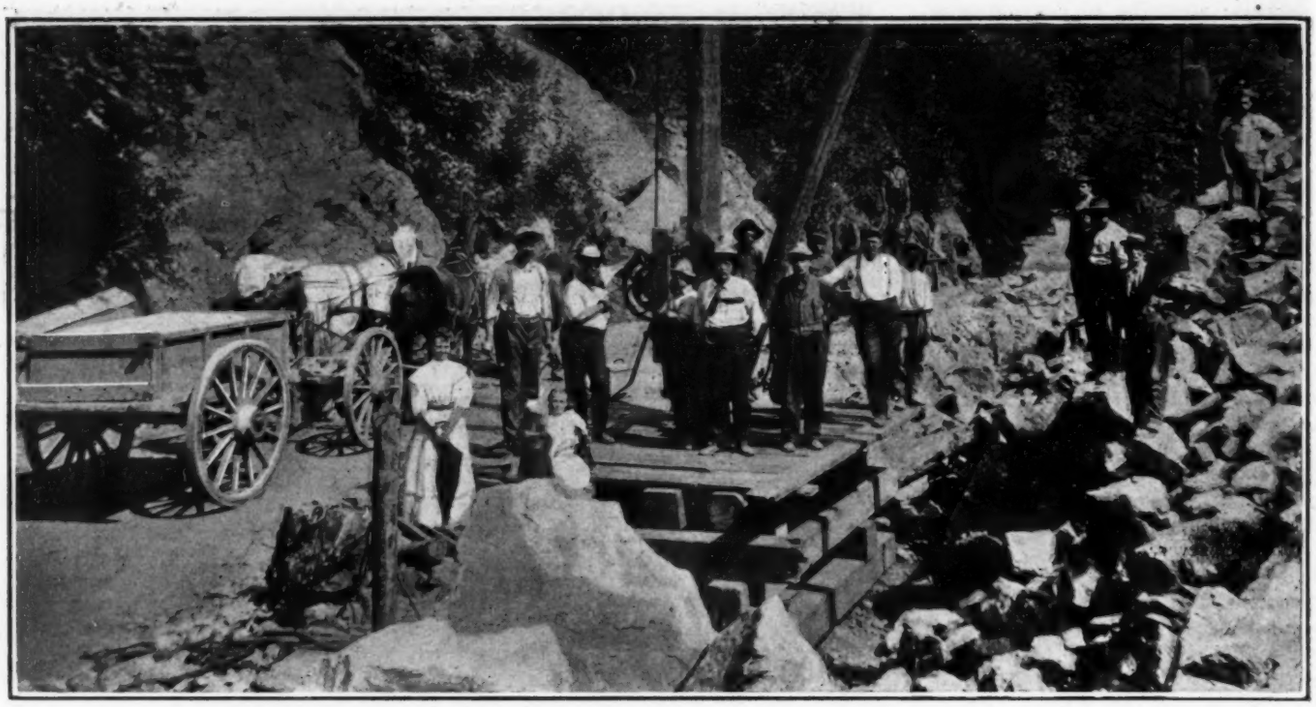
Rolling Down the Surface of Macadam Roads in Fairmount Park, Philadelphia, Before a Race

Making a Turn at a Speed of 25 Miles Per Hour on a Tar Treated Macadam Road Surface

A Dust Test on the Los Angeles-Pasadena Boulevard, Car Coming Towards the Camera

Another View of Dustless Los Angeles-Pasadena Boulevard, Car Going From the Camera

Bottom, at the Left, View of Bad Road from Slightly Different Position, After Improvement



Road Improvement in Progress, Showing Materials, Men, and Machinery Necessary to a Good Job

doubt due to the transmission of power at the point of load contact of the driving wheels.

From the point of view of the automobile proper, the amount of damage which can be done is proportional to the amount of energy which is wasted at the point of the transfer of same. When an automobile throws up a cloud of dust, it is claimed, as a rule, that it is destroying the roadbed, but looking at it from the other point of view, rather leads to the contention that it is merely disposing of the dust which must have been there at the time. What is wanted is a roadbed, the surface of which is so closely bound, and so thoroughly in keeping with the service conditions that dust will not be manufactured. The very binder which best serves for the purpose is the one which will abort dust formations. It will also defeat undue tire depreciation, because the transfer of energy at the point of contact of the tire with the road will be more efficient.

In a general way, the whole situation will receive an impetus in the right direction when roads are improved on a basis of the superior service which they will render with automobiles, rather than to continue to try to get along with roads which were formerly sufficient (if they were) under the conditions involving the use of animal-drawn vehicles.

Roman roads have lasted from a date 600 B. C., which goes to show that the Roman construction is more nearly in accord with our present needs than the macadam or telford work of our time. It is not necessarily the traffic which is at the bottom of the undue depreciation of the average road, and the very fact that some of our modern roads scarcely survive a single winter bears evidence of the ability of Jack Frost to upset the short-sighted plans of the taxpayer who grudgingly doles out the least possible amount of money for road building purposes, and in his disgust at having to pay anything at all, abandons the whole project, including his petty contribution, to the road building representative of the government, which in turn, becomes the victim of the contractor.

Taxpayers must first be made to realize that they will be the gainers if the roads are improved, and they must be made to understand that they must pay the cost of good roads; but these requirements will not prevent them from taking an interest in the further effort; they might just as well supervise the undertaking and see that the cost has an equivalent.

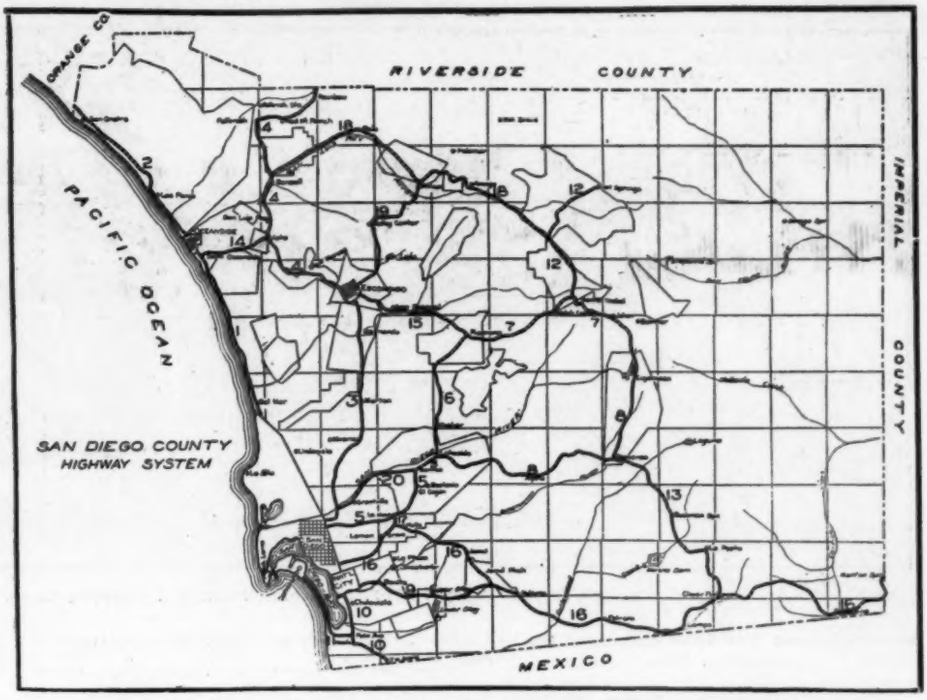
As a sample of the work being done in road improvement, a map of San Diego County, Cal., is presented showing the proposed new work there. The total covers some 448.5 miles, estimated to cost $1,250,000, an average of $2,800 per mile, which figure should produce an excellent road. The roads are all num-

Kind of Bad Roads Last Year's Glidden Pathfinder Found

Sample of Bad Roads Coast to Coast Racers Found in West

bered, and among them it will be easy to pick out any one. Thus, the longest route is number 16, San Diego to Imperial County, 77.4 miles to cost $227,960, this being at the same time the most expensive of the twenty roads laid out.

In the old art of road building, purely mechanical solidification by wedge joints between the elements of construction, and the shedding of water, were the objects sought. To this the new art, rendered necessary no less by the increasingly exacting demands of civilization than by automobile traffic, adds the requirement of adhesion of the hard substances of the road in a softer matrix, to reduce wear and dust formations, help out mechanical solidification and permit loosened material to find new and secure lodgement in the roadbed by the action of the traffic or by simple, inexpensive repair work, and adds also the requirement that the adhesive material shall bind whatever dust is nevertheless formed and prevent it from being drawn or driven into the atmosphere by the action of wheels and wind combined.



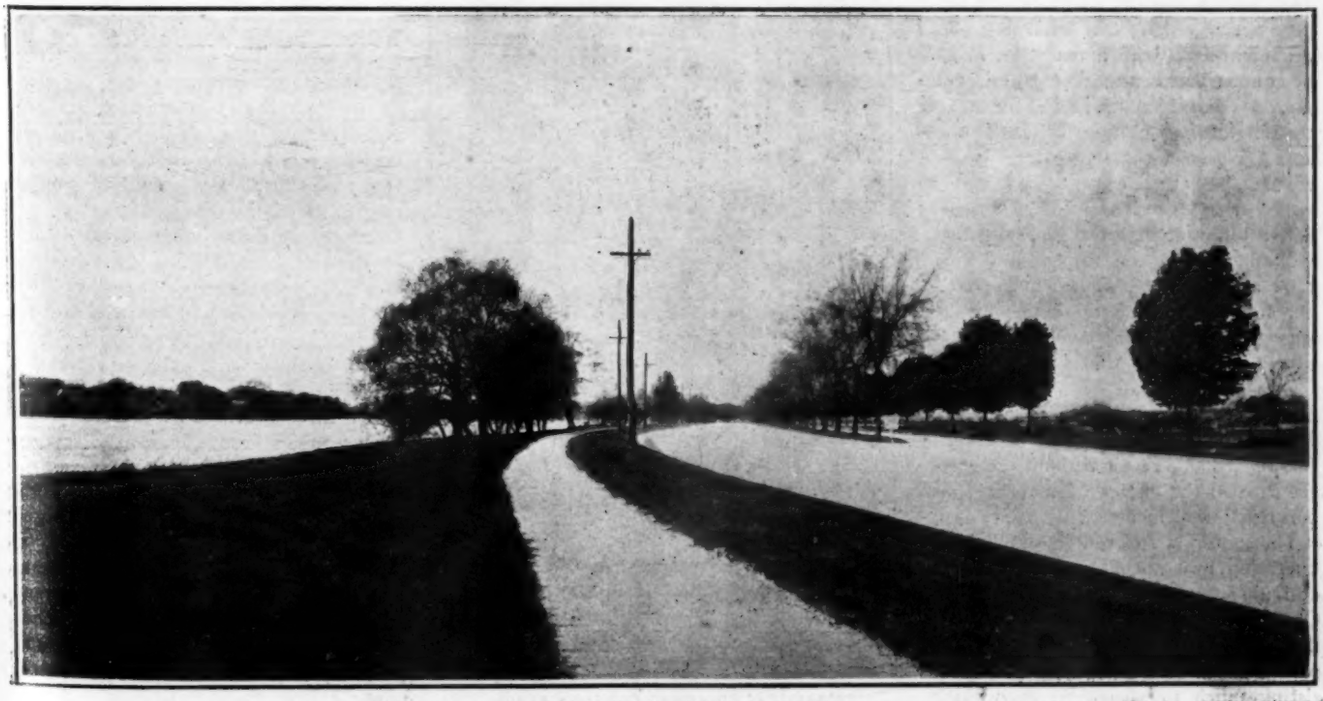
Map of San Diego County, California, Showing Road Improvement Work

Oil treatment has been narrowed down experimentally to repeated sprinkling with oils of asphaltic base which leave a binding residue, while all oils with a paraffin or naphtha base have been eliminated, as causing more mud, more odor, less binding and less durability. Oil treatment is applicable to earth, gravel, sand and stone roads, but not to clay surfaces, unless much gravel is admixtured. One of the most thorough oiling methods, producing the "petrolithic pavement" involves elaborate mixing and tamping of the surface to a 7-in. depth.

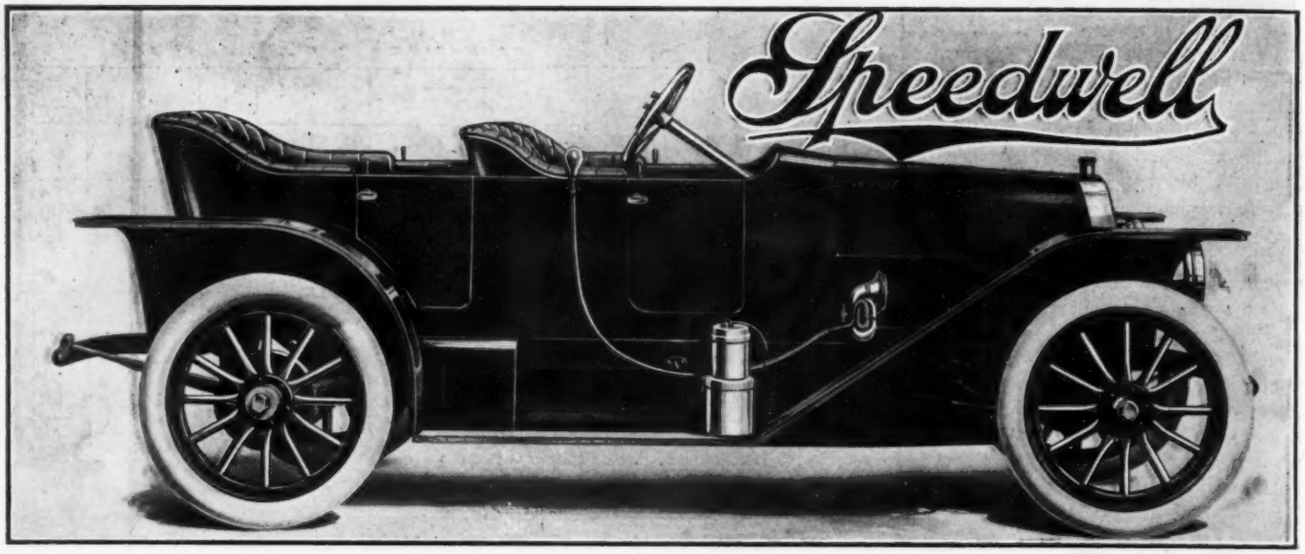
Treatment with emulsions purports economy of oil by combining it with soapy substance and water, easy application, absence of objectionable odors and immediate effectiveness. A number of different emulsions are commercially controlled, and each must be considered separately with reference to its action on the kind of road to which it is intended to apply it.

Solutions in water of calcium chloride or nitrate of soda, salt and lime or sand and soda fused, afford substitutes for sprinkling water and bind dust for a much longer time, but have no effect to reduce wear or dust formation.

Coal tar, as a material applied to finished roads, has been extensively used for broken-stone surfaces. The methods of application by spraying involve the use of pneumatic pressure for the spray nozzles, rather than heating of the tar. The most economical, because most thorough, use of coal tar is for the building of new roads, in which use it is mixed, instead of water, as a binder for pillar material and a paint for all crushed stone. Coal tar can be applied with success only in dry weather.



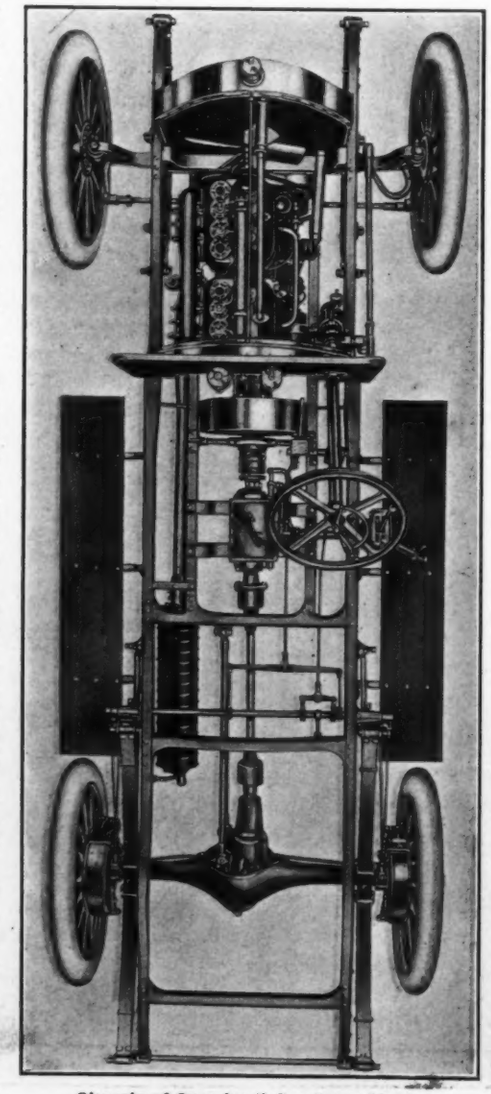
Example of a Fine Road Surface, as Prepared for Massachusetts, Showing Separate Road for Heavy Traffic



View of Torpedo Body Fitted to Speedwell Chassis, Showing Long, Rakish Lines

Manufacturers: Speedwell Motor Car Co., Dayton, Ohio

Motor, four-cylinder, 5 by 5 inches.
Cylinders cast in pairs, L type; valves on left side.
Water jacket heads separate, cylinder heads and valve chambers integral.
Crankshaft, drop forged alloy steel, with three plain bearings.
Camshaft, drop forged high-carbon steel, cams integral.
Crankcase, cast of nickel aluminum alloy, with wide flanges.
Ignition dual, Bosch high tension magneto and single non-vibrating coil; self-starter button on dash.
Lubrication of motor by gear-driven force-feed pump from 3-gallon reservoir in crankcase, by internal leads to all bearings. Circulating system with strainer.
Carbureter, Schebler Model L, hot water jacketed.
Gasoline feed by gravity.
Cooling by honeycomb radiator, gear-driven centrifugal pump and belt-driven four-bladed fan.
Clutch, leather-faced cone, with universal-joint alignment.
Transmission selective, amidships, three speeds forward and reverse.
Drive by shaft; two universal joints, double tubular torsion rod encased, and radius rods.
Rear axle, drawn steel type with floating shafts and removable differential; Timken bearings.
Brakes, four, internal and external on rear wheel brake drums.
Front axle, forged, I-beam section, knuckles mounted on Timken bearings; tie rod in rear of axle; reach rod above it.
Steering, by worm and full-circle spur wheel.
Front springs, semi-elliptic, 2¼ by 40 inches.
Rear springs, semi-elliptic, 2¼ by 56 inches, shackled at both ends.
Frame, pressed steel, channel section, narrowed in front, arched over rear axle; motor on subframe; cross members gusseted in one piece.
Wheelbase, 121 inches.
Tires, 36 by 4 inches, front and rear, Diamond or Goodrich.
Rims, Goodyear quick detachable.
Price from $2,500 to $3,850, seven styles.

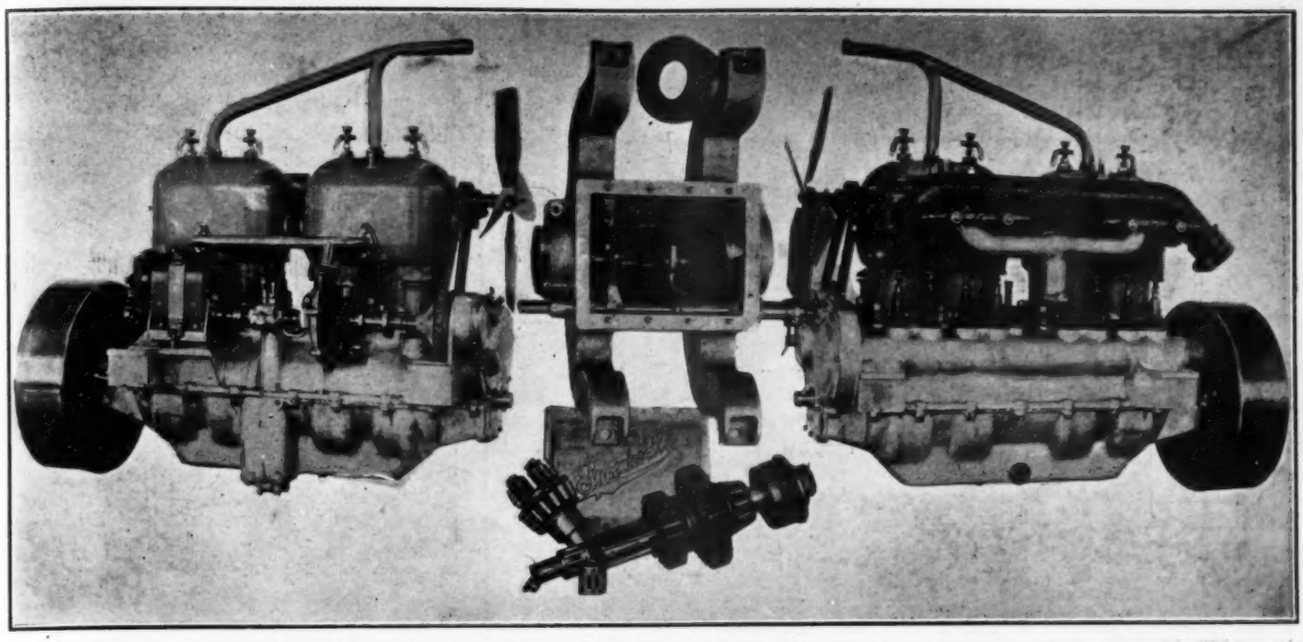


Chassis of Speedwell Car from Above

THE keynote of the construction seen in the "Speedwell 50" seems to be an extremely deliberate balancing of all considerations, with a tendency, in case of conflict between mechanical and commercial requirements, to safeguarding the engineer's solution first. The result has been a chassis provided with a robust, 50-horsepower engine, and to which it has been found possible to fit seven different styles of body without violating fitness, congruity and symmetrical appearance. In the seven-passenger touring car and the limousine, the springs are a grade heavier than in the other styles, and the tires are 4 1-2 inches wide instead of 4 inches wide, but otherwise the chassis is unchanged. It has not been possible to accomplish this remarkable result without the greatest care in the choice of materials and construction elements.

The motor is reduced to simplicity in operation and appearance by carefully designing away all superfluous parts. One of its attractive special features is the separate water jacket head for each part of cylinders, this construction assisting much to secure an even thickness of the cylinder walls; and, in case of accidental freezing of the cooling water, the damage is limited to the jacket head. The pistons are cast from reverberatory air furnace iron, the same as used for the cylinders, and are provided with oil grooves to help distributing the splash from the crankcase and four eccentric, lap-jointed expansion rings, three above and one below, are fitted to each piston. The enclosed camshaft, with integral cams, runs in three long phosphor-bronze bearings fitted with oil pockets, and is driven from noiseless bronze and steel gears, helically cut. The intake and exhaust valves are interchangeable.

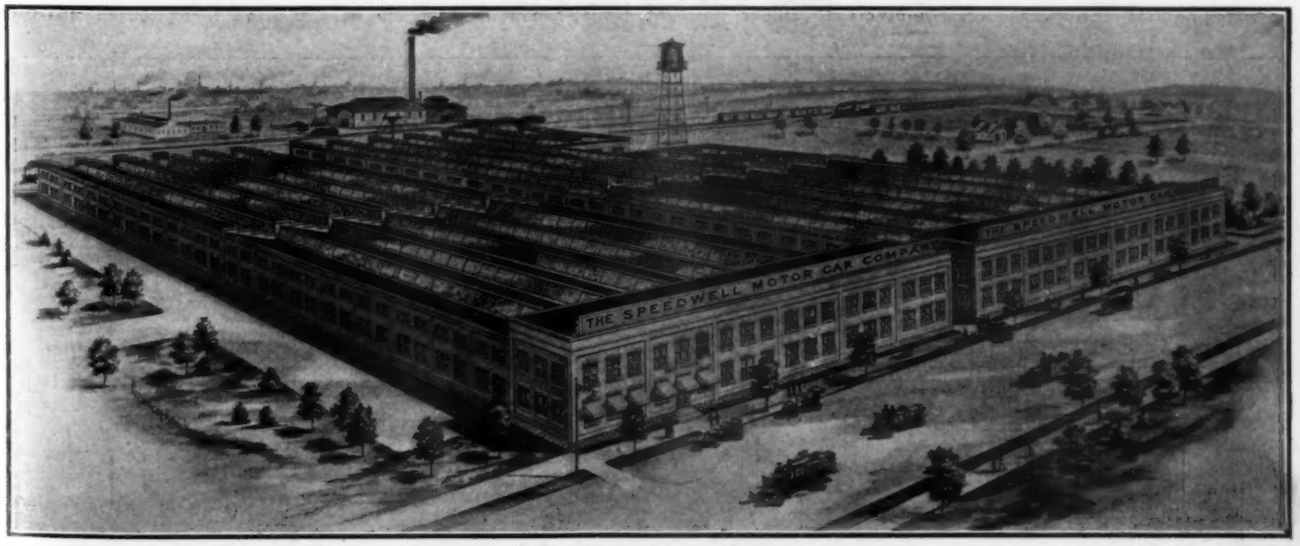
The three bearings of the crankshaft are of white bronze, carefully scraped and fitted and proportioned in accordance with the stresses and the weight of the flywheel. The crankshaft, forged from alloy steel and heat treated, is finished in a special crank-grinding machine, insuring a micrometric accuracy which would not be obtained by other means, except at prohibitive cost, and then not with the same degree of certainty.



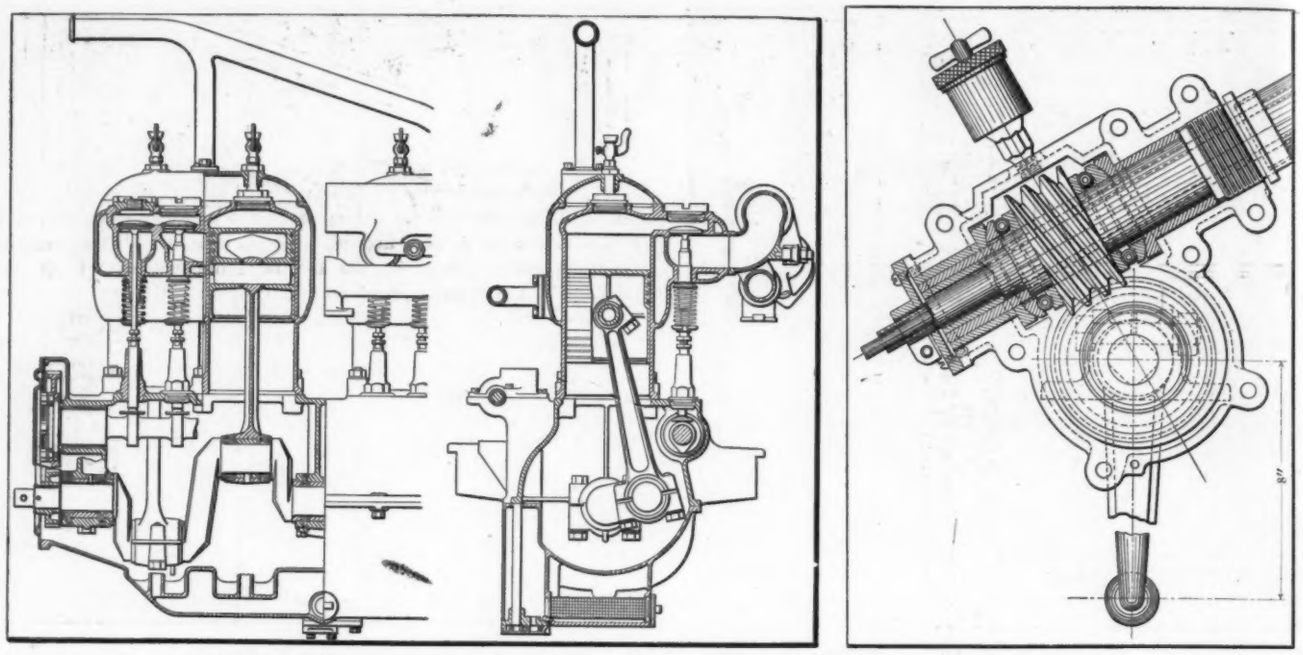
Two Sides of Engine, Showing Auxiliaries. Also, Transmission Showing Transmission Parts

The lubrication system throughout the "Speedwell 50" is very complete and, so far as the motor is concerned, practically automatic. More than forty grease cups are attached to various working parts, including the shackled joints of the springs, each of which is provided with a hardened bushing, and a large force feed grease cup takes care of the steering gear, while the change-gear and differential run in non-fluid oil and the universal joints are packed with consistent grease. Much care is manifested in the placing of the cups where they may be reached with ease. As most plainly shown in the accompanying sectional view of the engine and crank case, the motor is lubricated by a self-contained circulating system, comprising a three-gallon reservoir in the lower half of the crank case, from which the oil is drawn by a gear pump, there located, to a sight gauge on the dash, and thence by gravity or, if need be, by pressure to the bearings in the motor. The piston pin is reached in this way, both from the cylinder walls and by splash. A constant level in the crank case is maintained by an overflow pipe, which takes surplus oil through a metallic strainer back to the reservoir. The height of oil in the latter is read on a gauge conveniently located between the cylinders. The crank case is a sightly casting of nickel-aluminum, in which the crank wells are formed so as to constitute bulkheads, which equalize the amount of oil available for splash at each connecting-rod knuckle, independently of steep gradients of the road.

Cleanliness is taken care of in automobile construction mostly by preventing the lubricants from reaching parts where they don't belong and by reducing the handling of lubricants to a minimum. On the other hand, it is necessary to guard against the insecurity of lubrication which arises when it is attempted to lead oil from a single receptacle through several tubes to a corresponding number of bearings. Any one of the tubes may refuse to work for any trivial cause, while continued feed through the other tubes prevents the fact from being discovered till the dry bearing is scored and gives notice of an injury not easily remedied except by replacement. This matter has evidently been fully considered by the designer of "Speedwell 50." The crank case joint is broadly flanged and the bolts closely spaced, so that no oil will exude. In the change-gear, stuffing boxes on the drive shaft prevent all leakage. Other examples



Large Factory in Dayton, Ohio, Where Speedwell Cars Are Turned Out, Every Part Being Made Here



Sections Through Engine in Two Planes, Showing Details of Construction. At Right, Steering Gear

will appear in the following summary of the other features of the entire chassis, the résumé of the whole being given in the small type at the heading of this article.

The hot-water-jacketed model L Schebler carbureter is provided with three adjustments for low, intermediate and high engine speeds, and these adjustments have been fully verified through road tests of each carburetor at the Speedwell factory. The fuel feed to the carbureter is by gravity from the tank.

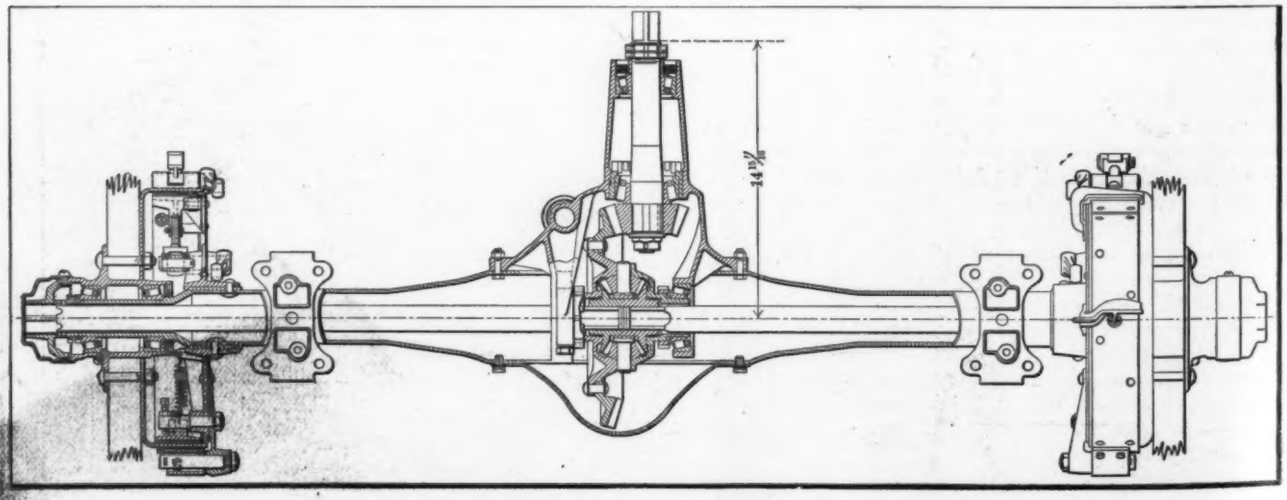
In the matter of ignition, the Bosch dual system has been adopted. The high-tension magneto and a set of dry cells both work on the same set of jump-spark ignition plugs, the dry cells operating through a single non-vibrating coil mounted on the dash in a brass casing fitted with a self-starter button. The circuit-breaker for the dry batteries is mounted on the armature shaft of the magneto, thereby dispensing with the timer.

In the change-gear, which is of the selective type, the driving and driven shafts are both mounted on Timken conical roller bearings, while the telescoping gear rotates on parallel unadjustable rollers. The shafts are of nickel steel and the gears of another alloy, usually designated as vanadium steel. Nickel steel is also used for the propeller shaft, which is forged in one piece with the retainer for the universal-joint cross. Under normal loads, the propeller shaft transmits power in a straight line from the change-gear, which is mounted amidships on a cradle in the subframe, to the bevel gear pinion and differential on the rear axle mechanism, and losses in the transmission of driving energy are further minimized by fitting this drive with two universal joints protected and kept clean by a tight metal casing.

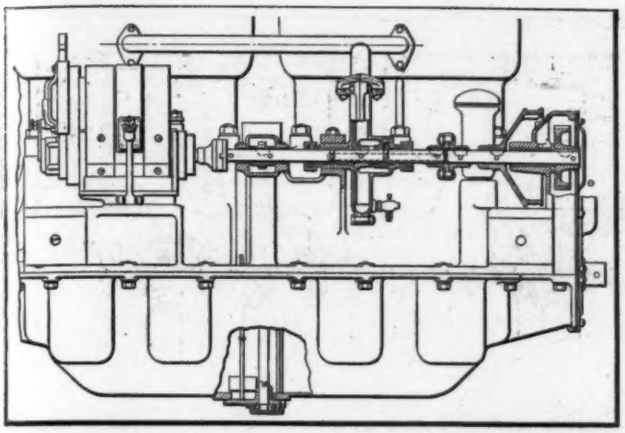
Starts and stops are cushioned by means of a torsion tube hung between oil-tempered springs from the midway cross-member of the frame through the intermediation of a dustproof casing, and the latter is connected with the rear axle by a double torsion tube. Radius rods are also provided to relieve the rear vehicle springs of driving thrusts, so they may be shackled at both ends and have free action, and the radius rods are secured to the frame reaches on each side by ball joints.

The rear axle is of the full-floating pattern, in which the shafts that turn the wheels have nothing else to do, and all weight and road shocks are borne by the tubular housing. Here the pinion shaft, bevel gears and differential run on Timken bearings adjustable for wear, and a large inspection plate permits adjustments and replacements.

The brakes are of the approved external-contracting and internal-expanding type, the service brake being the external one



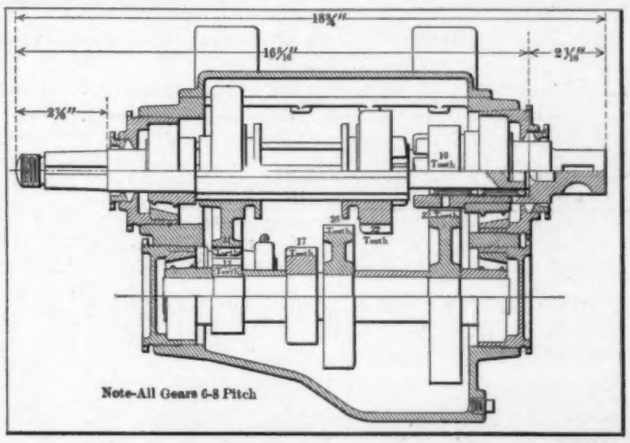
Rear Axle of the Full Floating Type is Made by Timken, and Taper Roller Bearings Are Used Throughout



Side of Engine, Showing Auxiliary Shaft, Magneto Drive, Etc.

and actuated by pedal, while the emergency brake is operated with a hand lever. This control approaches closely to the generally accepted standard. The brake rods are fitted with equalizers distributing the pull evenly to both brake drums, regardless of small variations in the adjustments of the brake bands, the lining of which the makers guarantee against burning.

The construction of the self-contained cone clutch mechanism is shown very clearly in one of the accompanying illustrations. The end thrust of the clutch engagement is absorbed in a large row of steel balls, and the possible unalignment between motor shaft and transmission shaft, which in former days was the cause of practically all the troubles experienced with leather-faced cone clutches, is neutralized by means of the universal joint shown in the illustration, and the mobility of the joint is secured by keeping it packed in grease. The operation of releasing the clutch at any engine speed is facilitated by a ball-bearing thrust-ring in a dust-tight casing upon which the release-yoke acts.



Transmission Section Showing Liberal Use of Taper Roller Bearings

The cooling apparatus is commensurate with the high power of the engine, the radiator being of true cellular design and the centrifugal pump of large dimensions. This pump, the magneto, the oil pump in the crank case reservoir and the four-bladed fan driven by eccentrically adjustable belt, are all operated from the auxiliary shaft on the right side of the engine.

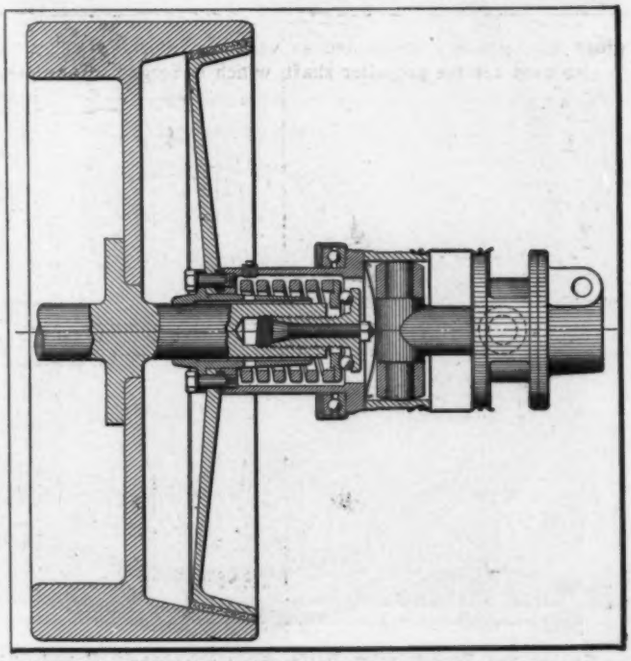
Throttle and timing control are operated in the usual manner through the steering pillar. The steering gear consists of an eighteen-inch wheel of wood on an aluminum web and spider, the tubular steering post, to which is secured a double worm of relatively low pitch, making the action merely irreversible, meshing with a complete spur wheel. The full steering swing involves only 90 degrees of this gear, so that four different portions of the gear will afford the user of the car assurance against loss in his steering mechanism for many years. The provision of a large force-feed grease cup, keeping all rubbing surfaces well lubricated, serves the same end and security against seizing as well. Both the worm and the spur wheel are made from hardened and ground alloy steel. The tie rod is placed behind the rear axle and the reach rod above it, giving the maximum protection against injury from boulders in the road and similar obstructions.

The front axle is an hydraulic forging of I-beam section, toughened by heat treatment and with integral spring seat broadenings of the top flange. The knuckles are mounted on Timken bearings at top and bottom, and the wheels likewise on their rock shafts.

Front and rear springs of the Speedwell are all semi-elliptic and nearly flat, in accordance with modern practice. All eyes are lined with hardened bushings, and all leaves are lipped to maintain their alignment. The front springs are 40 inches long, the rear springs 56, and all are 2¼ inches wide. In the cars fitted with heavy bodies the thickness of each leaf is increased. So as to provide liberal spring action over the rear axle, the frame of the car is here arched, while in front it is narrowed in order to allow sharper turns of the front wheels. It is of channel-section pressed steel with a sunken sub-frame bringing the center of gravity close to the ground in conjunction with ample road clearance. The cross members of the frame are all made with integral gussets, giving a broad and secure attachment to the main frame reaches and reducing the strain on the rivets. The wheel base is 121 inches.

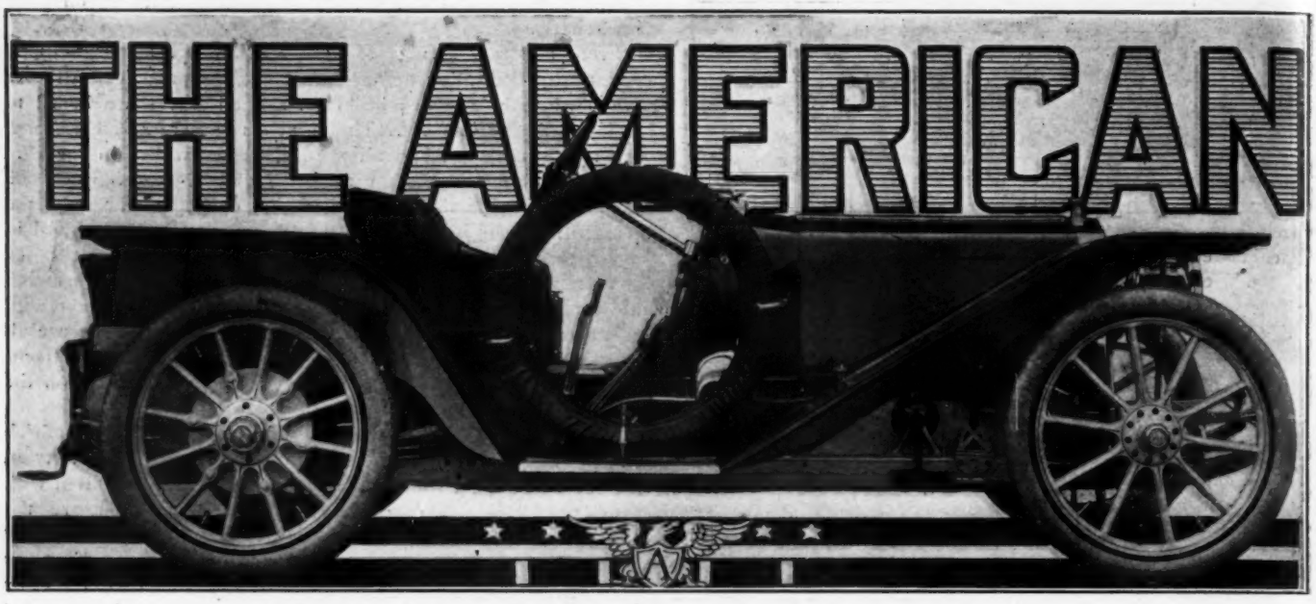
All wheels are of the same size, taking Diamond or Goodrich tires, 36 by 4 inches, with the exception that the heavy body styles, the seven-passenger touring car and the limousine are fitted with tires 4 1-2 inches wide. The body styles produced are the following: A four-passenger toy tonneau, a five-passenger touring car, a roadster or semi-racer for two, three or four occupants; a close-coupled tonneau for five passengers, all these costing $2,500; further, a seven-passenger touring car and a Speedway Special, with a body of striking design, reminding somewhat of the British Lancaster car, these costing each $2,650; finally, the limousine for seven passengers, costing $3,850.

With long wheelbases, wide tread—that is, standard—well designed and large-sized springing, the riding qualities are all that could be expected in a car of this size. The amount of power provided is also ample, either for steep and difficult hills, or for speed work on the level, such as all drivers want to indulge in at times when the spirit moves them.



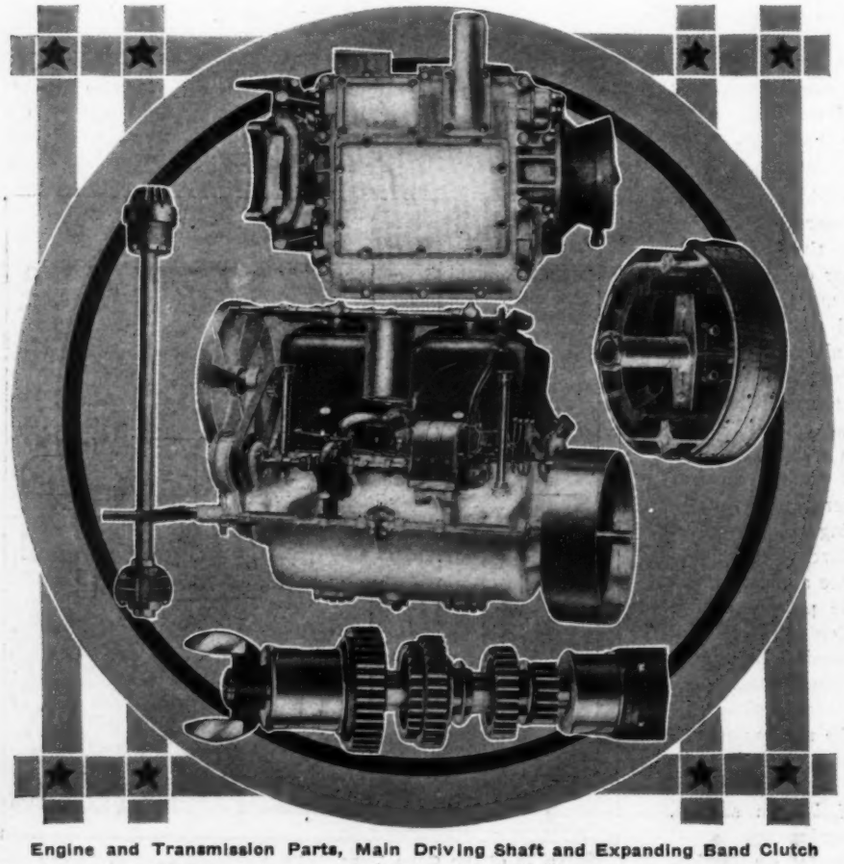
Clutch is of the Cone Type, With Enclosed Central Spring

THE AMERICAN



American with Traveler Body, the Chassis of Which is Underslung

JUST what importance should be attached to the features in which "The American" differs from all other American automobiles depends largely on the point of view. They produce a highly distinctive appearance and a remarkable steadiness of motion at high speed and turns, and this steadiness, of course, raises the average speed at which the car is operated by its owner and probably also increases his ability to handle the car skillfully at all speeds above forty miles per hour on the road and above sixty miles on the race course. The close hugging of the ground at rapid turns and curves keeps the driver's mind composed, which is the principal requirement for safety in driving at the ordinarily forbidden gaits. But cars habitually driven fast do not last long, unless their design, materials and workmanship help them out. Their tires, too, wear out and tear out quickly by the strains to which high speed exposes them. This is the general rule. But the American, though rather heavy among modern cars, offers the speed without all of its mechanical and financial penalty. The tires last as long as under cars of lighter weight and lesser speed inducements, and the mechanism, generally, "stands up" to its work well enough to keep it in the market year after year at a price competing only with the expensive cars of high renown. These peculiarities seem to be established as more than mere claims and suggest some inquiry and attention with regard to the exclusive feature of design to which they must be due. The underslung frame is the keynote in this design. By hanging the frame on springs secured under the axles instead of above them, the center of gravity is lowered and a change is effected in the direction of stresses arising from stops and starts and from the centrifugal action which tends to upset a car at rapid and sharp turns. The stresses referred to are especially those acting against yielding parts, such as springs and shackles, the frame itself, the tire fastenings and the tires. Owing to the yielding nature of these parts, the weight supported on the frame of an automobile is really shifted forward or backward at starts and stops, and sideways at turns. At a sharp turn the outside tires are loaded more heavily than the inside ones, and the latter are inclined to bound under the reduced load, if the load is lumpy in the least degree. The last-mentioned effect which is disquieting to the driver and wearing on tires is particularly reduced by low suspension of weights, though the strain on tire fastenings may be correspondingly increased.



Engine and Transmission Parts, Main Driving Shaft and Expanding Band Clutch

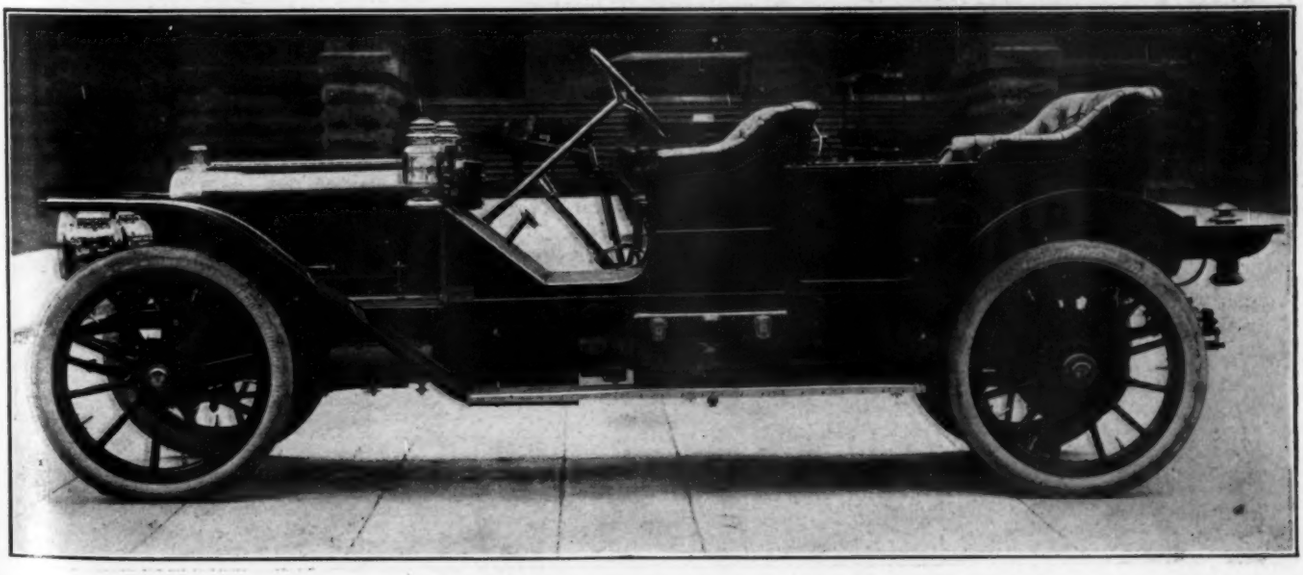
In four out of the six models of the American, manufactured by the American Motor Car Company, of Indianapolis, the advantages of low suspension and low center of gravity are materialized, and by means

of large wheels, taking 40 by 4-inch tires in front and rear, the underslung design has been reconciled with a road clearance of 12 1-4 inches in three of these models, and the advantages of wheels and tires of large diameters have been added. In the American Roadster Special the tires are 34 by 4 inches in front and 34 by 4 1-2 inches on the rear wheels, and road clearance is reduced to 9 1-4 inches under the whole length of the car, but the special features of low suspension and stability are accentuated.

Many of the general construction details of the American are shown in the accompanying illustrations, but cannot be described for lack of space. One of the improvements over earlier models consists in the adoption of the F. & S. annular bearings in most places where adjustable three-point bearings were used before. The passage of cooling air through the radiator and all the way through the bonnet is secured by using fan-blade spokes on the cone clutch as well as on the flywheel. Gasoline was formerly fed by pressure taken from the exhaust, but now a compressor pump gear-driven from the camshaft, close to the flywheel, supplies a steady pressure of 1 1-2 pounds from atmospheric air. The pressure can be adjusted to a maximum by adjusting the size of the compression chamber, while any surplus pressure automatically escapes. The universal joint on the propeller shaft is of improved type and the key plates driving the rear wheels are forged in one piece with the floating rear axle shafts. There is noted a convenience in the form of a pipe connecting the tank for lubricating oil with the crankcase, so that oil in the latter may be replenished by simply turning a stopcock. An internal gear pump feeds the oil to the engine bearings, but if splash is desired in addition, it can be had by raising the level of the oil.

End View of Engine, Steering Gear, Rear Axle, and Transmission Parts

In underslinging the chassis, some slight trouble was found in the engine crankcase shape and placing. This was easily remedied by placing the arms of the crankcase very low, and bringing the supports up very high to meet them, the latter being set well above the main frame of pressed steel, and being themselves of pressed steel. Even this placing of the power plant did not introduce any uncertainty of accessibility, for the arms divide right at the parting of the crankcase, so that the lower half is entirely below the subframe, and thus removable from below without disturbing the latter. So, it is, that despite the underslinging and very low center of gravity, the engine bearings are as accessible as any overslung car of the modern type. From the appended illustrations of various parts of the car selected at random, it may be noted that the whole design shows nothing of the freak, being designed—aside from the underslinging—strictly along conservative and approved lines, and following what few accepted standards there are in existence in the automobile business to-day.

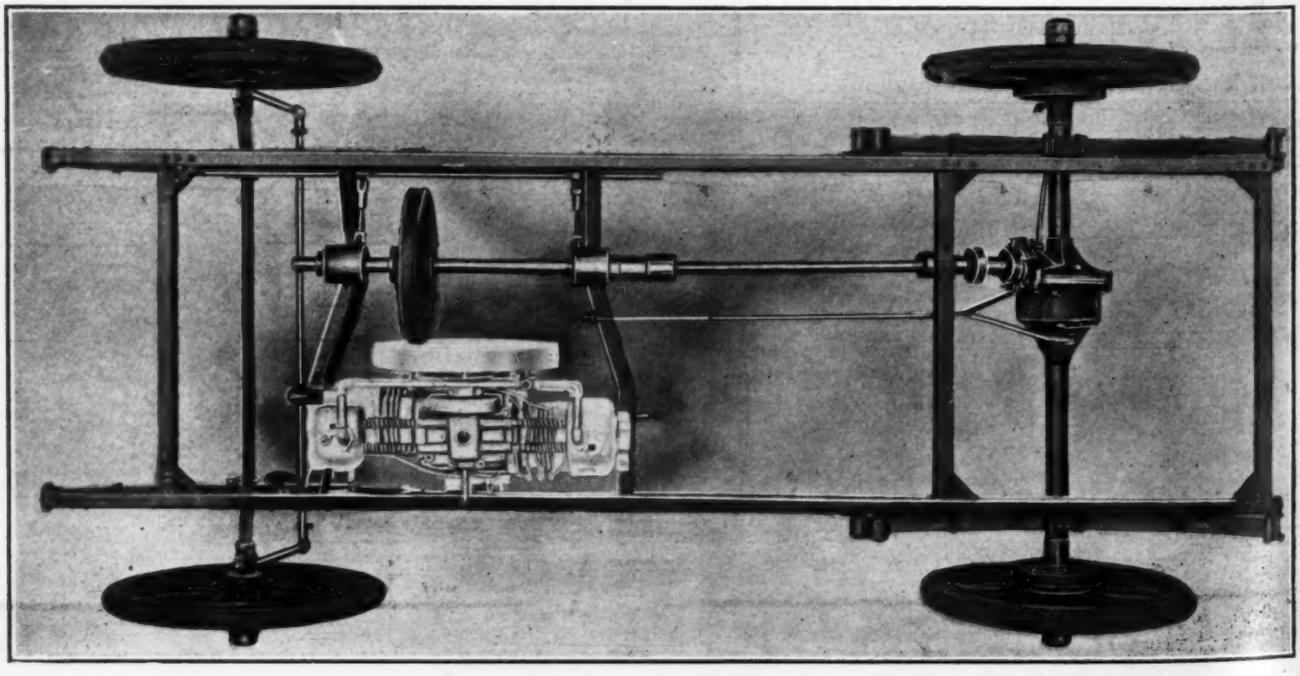


Touring Body on the Regular Model, Known as The Tourist, 50 Horsepower.

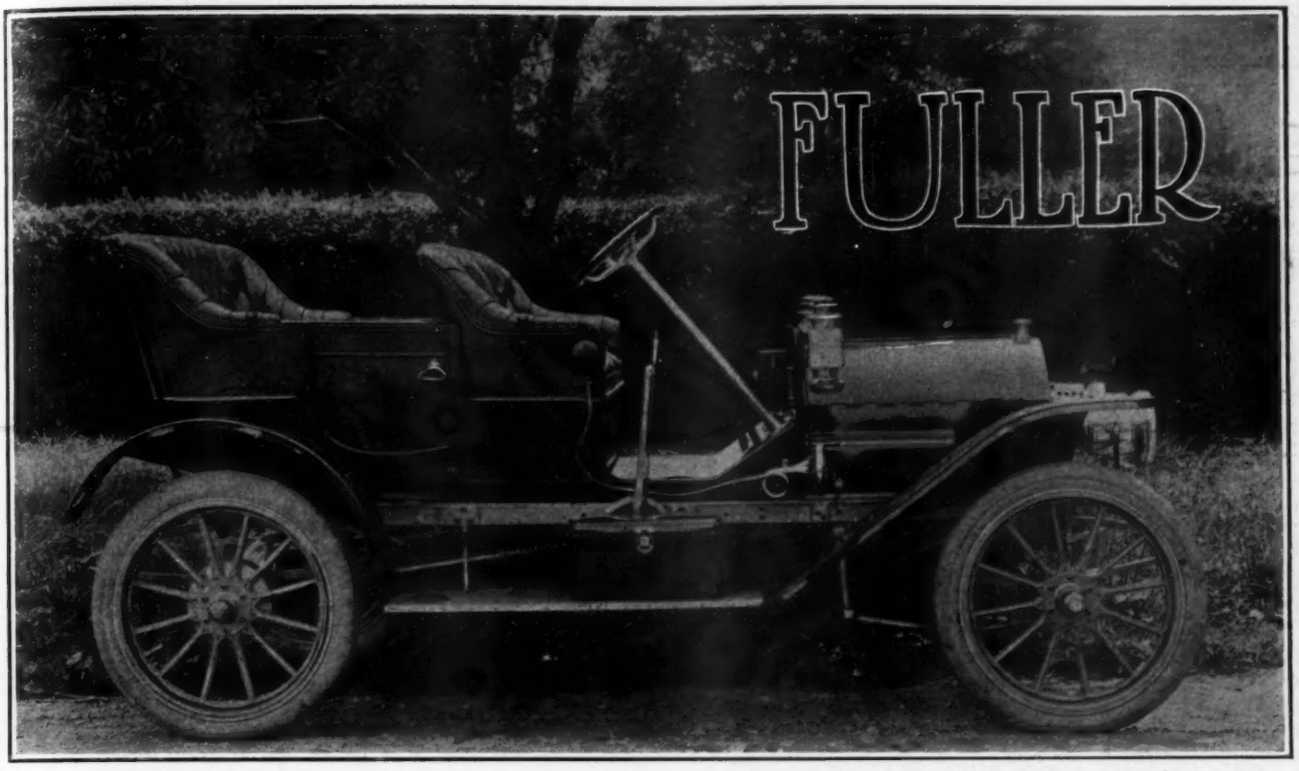
Delivery Wagon as Made by the Van Dyke Motor Company, of Detroit, Mich., a Newcomer

UTMOST simplicity of construction and the price of $750 for a complete delivery wagon, self-propelled, form the basis of comprehensive plans with which the Van Dyke Motor Car Company is entering the automobile industry, with temporary offices at 1221 Ford Building, Detroit, Mich.

The design, whose general features are sufficiently indicated in one of the accompanying illustrations, is due to the ingenuity of George P. Davis, of Detroit, and shows a well-defined purpose to take advantage of the advanced reliability of motors and parts for eliminating every element of construction which would add to the cost and trouble of upkeep and which may yet be superfluous for the successful transportation of light and bulky merchandise. George A. Trout, as general sales and factory manager, is to take care of those qualities of materials which will safeguard the results. Plans are under way for a factory with space for assembling, body-building and painting.



Chassis of Van Dyke Delivery Wagon, Showing the Two-Cylinder Opposed Engine and Friction Drive



Touring Car as Made by the Fuller Buggy Company, Jackson, Mich., a Newcomer, Has Pleasing Lines

IN the recent models of cars made by the Fuller Buggy Company, of Jackson, Mich., a number of changes are made as compared with the design shown in the accompanying illustrations, and all of them are in the direction of improved style in details and the correction of those minor imperfections which are inseparable from all beginnings. Among the leading features which remain unchanged, are the following: In the $1,500 model, the four-cylinder motor is 4-in. bore by 4 in. stroke, developing a little more than 25 horsepower, tubular radiator, planetary transmission armored wood frame, five plain bearings for the crankshaft, roller bearing axles, weight 1,900 pounds, tires 32 by 3½-in. front and rear. In the $2,000 model, the four-cylinder motor, 4½ by 5, developing 32 horsepower, the cellular radiator and a total weight of 2,100 pounds, constitute the principal distinguishing construction features, aside from the differences in style. Both types have double ignition, by magneto and dry battery, multiple disc clutch, lubrication by gear pump and two speeds and reverse by the planetary transmission. The drive is by shaft to the semi-floating rear axle, and the springs are full-elliptic in front and rear, protected by substantial radius strut rods from the rear axle to the frame reaches. A roadster type, Model 30, with rumble seat, has been added to the output of the firm. The development of the Fuller Buggy Company's production of automobiles has been so rapid, in response to the demands of the market, that great ability has been required in the mechanical department for keeping pace.

A Car with High Wheels and Solid Tires for the Country Folks is Also Made by the Fuller Company

IN THE SOLUTION OF SOME RADIATOR PROBLEMS

FROM the radiators as used in the earlier makes of automobiles down to the types as they obtain at the present time, represent a long series of attempts to bring about the highest obtainable efficiency and great life of the radiators in service. Efficiency and life seem to oppose each other, it being the case that the methods by which efficiency is increased are those which are likely to produce a mechanically weak structure.

The power which may be taken from a given motor depends upon the fuel which is burned to carbonic acid and water in the process, but since the thermal efficiency of a motor is probably under 20 per cent. in the best types, and an average of perhaps 16 per cent. in good motors, it will be appreciated that as the power of the motor is increased the quantity of heat which must be absorbed by the water in the cooling system increases enormously. The only possible way that the power of a motor can be increased without seriously affecting the proportions of the radiator is that which involves an increase in the thermal efficiency. It took a great many years to bring the thermal efficiency of steam engines from say 5 per cent. at the start to 16 or 17 per cent. as they obtain in the best types at the present time. There is small chance of this type of engine being increased in point of thermal efficiency to any great extent. The internal combustion type of motor made a somewhat better thermal showing from the start, and it is reasonable to suppose that the thermal efficiency in the crude types of internal combustion motors approximated 10 per cent.

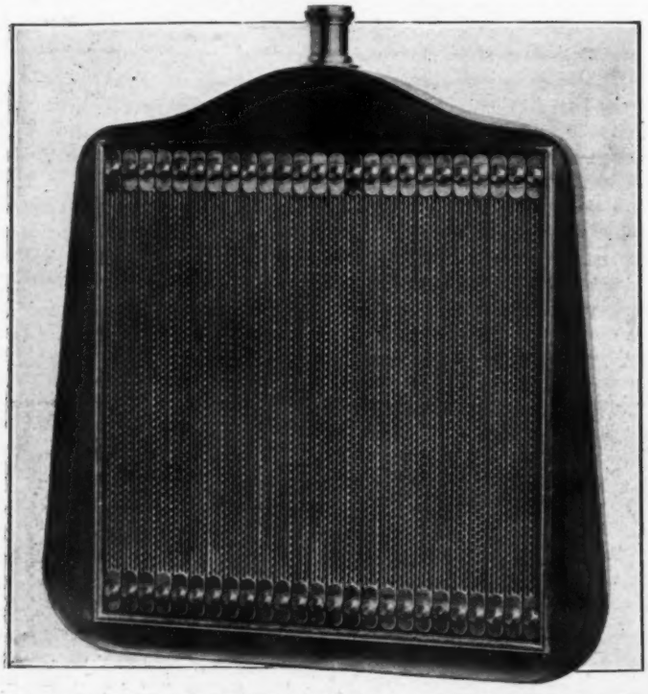


Fig. 1—Appearance of the finished radiator, ready for use, showing that it has an excellent appearance

During the last ten years the thermal efficiency of internal combustion motors due to their better construction as developed in automobile practice was increased from the low figure above given to approximately 20 per cent. in the very best types of the present time. This change had the effect of reducing the cooler requirement to one-half of that which obtained in the primitive automobile applications, but it still leaves an enormous amount of heat which must be taken care of either by the radiator or by way of the exhaust.

Attempts have been made from time to time to reduce the amount of heat which would have to be absorbed by the exhaust, which efforts involved the use of large valves, and a timing of them such as would give to the exhaust the widest possible opportunity to escape. It is possible that in some of these motors the heat which must be absorbed by the radiator falls to a point considerably below 50 per cent. of all the heat represented in the fuel used.

In everyday practice, considering the problem as a whole, the cooling situation is complicated by the fact that flexibility is desired, and it is further influenced in view of the practice of the average autoist who persists in slowing the motor down by the process which involves the retarding of the spark. It is on account of this cooling problem that most taxicabs, for illustration, are so designed that the spark is fixed but the average efficiency with a fixed spark, while it will not be the maximum obtainable, will be better than that which can be realized if the chauffeur lacks ability to reason, and drives his car on a basis of cause and effect. The chauffeur soon learns that the motor will lose power when the spark is retarded, and the car will slow down in consequence; if his knowledge does not grow beyond this point, it will take a very extraordinary radiator to absorb the heat which will be given off by the motor, without causing the water to steam.

An overheated motor is incapable of delivering its maximum power, and if the condition of overheating passes beyond a certain point, the amount of power may reduce excessively. The pumping losses in a motor increase enormously with increases in temperature beyond a certain point, which losses may be subdivided in the manner as follows:

(A) The increase in temperature rarefies the incoming mixture, and the weight thereof will be decreased accordingly, so that the possible power of the motor will be lowered in consequence.

(B) The higher range of temperature will introduce lubricating trouble, and the friction loss will be enormously increased.

(C) If the condition of heating passes beyond a certain point, the piston clearance will reduce because the piston will swell faster than the bore of the cylinder will increase, and this con-

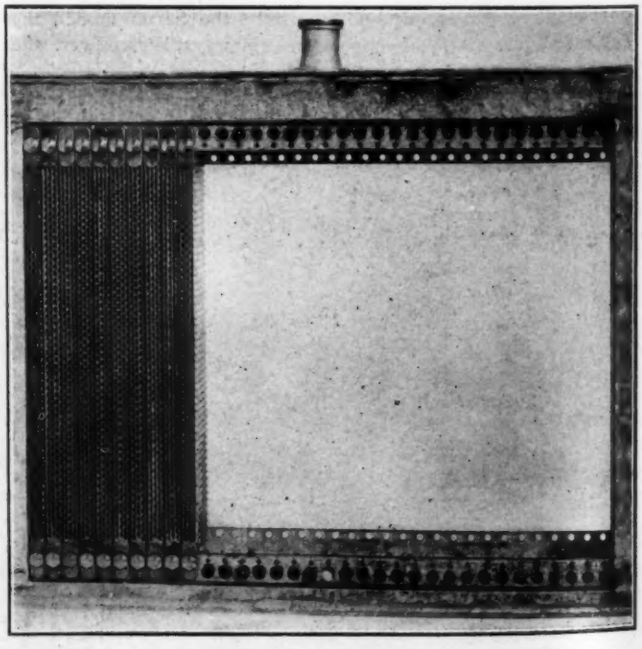


Fig. 2—Truck radiators are made like those for touring cars, the difference being in the size and shape

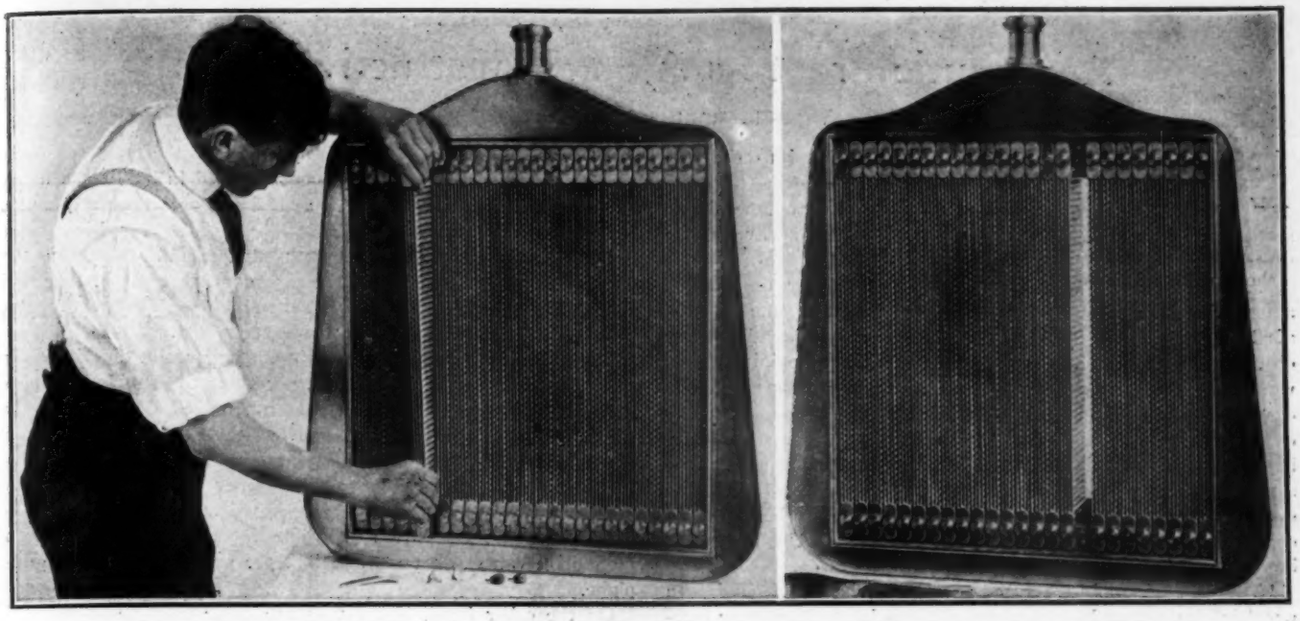


Fig. 3—Method of removing individual sections of the new radiator. At the right, appearance when a section is removed

dition may extend to a point of sticking of the piston.

(D) It is highly improbable that expansion due to heat will take place uniformly in all radial planes, and piston distortions will scarcely conform to cylinder distortions due to heat, so that there will be zones of excess pressure which will increase the pumping losses.

With these increases in pumping losses, the remaining sources of the same character of losses will be more or less influenced, and it is scarcely to be supposed that any motor will satisfactorily perform excepting when the temperature is properly regulated, and this condition will only obtain if the cooling system is maintained in good working order, provided it is properly designed in the first place.

Passing beyond the motor, the remaining important questions are tied up in the radiator and its construction, together with the means of water circulation. Considering a given motor, the size of the radiator will depend upon the rate of circulation of the water to a considerable extent, although it has been determined that the advantages derived by circulation cease after a certain point is reached. If the ratio of radiator surface to flame-swept surface in the cylinders is properly regulated, the circulation may be that ordinarily called thermo-syphon (natural circulation). Obviously, this character of circulation is relatively sluggish, and the ratio of cooler surface to flame-swept surface in cylinders must be adjusted accordingly.

If a pump is used, the size of the same may be anything, and the rate of water circulation may then be increased to any desired point, but, as before stated, it has been found that it does no particular good to increase the rate of water circulation beyond a certain point. As a practical figure, it may be said that 1 1-3 pounds of water per horsepower per minute will suffice for the average automobile if the radiator is well designed.

There is one point in this connection which does not usually receive consideration: if the amount of water present in the system is much restricted, steaming will transpire, due to the fact that the steam which is formed over the hot surfaces of the combustion chamber will not be afforded sufficient time and water in which to be condensed. Condensing takes time, and that steam does form over the dome of the motor cylinders has been shown. In designing a cooler, then, it is necessary to consider not only the surface exposed to the air draft, but the quantity of water which will be necessary as well.

In practice there is a further and disconcerting factor due to the deposit of foreign substances out of the cooling water, which deposit forms a coating over the wetted surfaces in the cooler, and this coating being almost a non-conductor of heat reduces the efficiency of the cooler enormously. The factor of inefficiency due to incrustation increases as the square of the thickness of the coat formed.

The idea of being able to demount the radiator seems to be a good one, since then the several sections may be treated separately, and by means of direct pressure it will be possible to eliminate the incrustation, and, as a further advantage, it will be possible to repair leaks which may develop in one or more of the sections. One of the important considerations is involved in the ability to remove a section with the car on the road and to plug up the openings, thus rendering the radiator sufficiently capable to serve for the purpose, even when one or more of the sections are disabled. This idea is here illustrated in which Fig. 1 shows the radiator complete, with means at the top and bottom of the sections by means of which they may be removed at will and through which they are held in tight relation at all other times. This type of cooler was developed by Rehringer Radiator Works, 83 Fulton street, New York City. Fig. 2 shows a form of this cooler designed for commercial car work, with all but 10 of the radiator sections removed, thus giving an excellent idea of the method in vogue. Referring to Fig. 3, the same cooler as illustrated in Fig. 1 is shown at the right with a section removed, and at the left with the process of replacement of a section under way.

The sections of this form of radiator are made up of flat copper plates corrugated to give strength and to increase service. Three of these ribbon-like water tubes go to make a section, and the means of holding the sections into place constitute a dowel pin at the top and bottom to the rear of the sections engaging a back plate. Water passes from the frame proper through the die formed, engaging terminals as shown in rows across the top and bottom of the cooler, and a tube inserts with a packing ring in concentric relation, so that the joints are made tight when the holding screws are pressed home. It is claimed for this new design of radiator that it has precisely the same radiating surface, volume of water, and other desirable conditions as will be found in the better types of radiators in general, and the scheme of design is such as to permit of the removal of any section at will, either for the purpose of repair or for the removal of incrustation. Every facility is offered for the quick removal of any one or all of the sections, and the means of packing at hand are such that tightness is bound to follow if the holding screws are pressed home, which is a mere matter of the vigorous use of a screwdriver in the absence of any great skill.

Aeronautic Progress Along Constructive Lines

By MARIUS C. KRARUP

LAST week a number of theses closely related to the construction of aviation machines were presented. Some of them were in agreement with accepted aeroplane theory and practice, but others were at variance. This rapid, introductory presentation of theories or statements all of which are not above debate, is continued in the following. The most unorthodox among them are capable of defense in the present state of technical knowledge of the subject. If some of them should provoke observing readers to the expression of contrary opinion, there would be gained an acceptable basis for a more thorough discussion, from which in the end a stock of real data on aeronautic engineering may be laid by. The many shortcomings still attaching to aviation machines make it a foregone conclusion that no set of theories which would at present seem acceptable to all, even the best informed, can have any chance of being found correct or complete later, in the light of the developments and improvements which are to come.

If the balancing and safety of aeroplanes were to depend on a watchful control action, necessarily following rather than forestalling the disturbing influence—since the latter always takes the form of invisible air currents or eddies—the chances for aviation becoming a practical form of transportation would be removed to a dim future, but the introduction of flexible elements in the planes will place this matter of safety on a new footing. As it has been shown that an aeroplane can be jolted out of balance by gusts, it is just as certain that it will require a flexible and resilient suspension, as that an automobile requires springs. But the reasons are more numerous and urgent, because the aeroplane "springs" will not only smooth the road and preserve the balance but will also harden the road; that is, make the planes more efficient as supporters of weight. The theories and mechanics on this point are intricate but interesting.

With the aeroplane machine a rigid construction, as it is today, any control device which shall give hope of enabling the aviator to right the structure after its equilibrium has been disturbed, must be extremely quick in action. The loss of equilibrium places gravitation in charge of the machine for the moment. Consequently, the control device must be actuated by something much quicker than gravitation, such as is brought into play by shifting of weights. Muscular activity is such a quick-acting force only if the recoil from the push or pull does not counteract the intended control movement by shifting the weight of the operator's body in the wrong direction. It is best to spend the reaction from a muscular control effort as a strain to separate two rigidly connected portions of the structure. In some machines these reactions from control movements are very properly spent in a strain reaching from the footrest through the aviator's body to the back of the seat.

But all control is still a makeshift. Quick action is sought in placing the control planes a considerable distance fore and aft of the main plane or planes, so as to give them long leverage, but the same provision also gives a gust of wind acting upon the control planes a long leverage to upset the machine.

It is doubtful if the balance of an aeroplane, once lost, has ever been regained by means of the control apparatus. The latter consists only of rudders, and the action of rudders depends on speed, and this speed must, moreover, be very nearly in the direction of the rudder's normal extension. If the upsetting force jolts the machine more than twenty degrees away from its normal poise in the atmosphere, while its momentum perhaps still carries it on in its previous direction, or if the jolt in any way stops its progress, the present control apparatus is useless. Automatic stability, probably by means of flexible and resilient elements in the planes and reinforced by a low center of gravity—though the latter is wholly superfluous during normal flight—is therefore absolutely predestined to engage attention.

The relative merits of biplane and monoplane are most clearly shown in the fact that nobody has succeeded in building a flying monoplane so large or so heavy as biplanes are frequently made, although materials and workmanship have so far been more select in monoplanes. To get both surface and strength in the monoplane it has been necessary to broaden the plane, fore and aft, and this produces irregular shifting of the centers of pressure or support, as planes are made at present.

To hold these broad planes to a regular tilt, despite their naturally fitful action, it has been necessary to provide long tails and to have these tails so heavy as not to be self-supporting in flight. This provision, again, has reduced the advantage which the monoplane would otherwise intrinsically have over the biplane by virtue of smaller air resistance per square foot, by compelling the monoplane to be operated at higher tilts. Probably the higher tilts are responsible for the impression that a monoplane can support more weight per square foot than the biplane.

On the other hand, if the tails are made nearly self-supporting by means of attached surfaces, they become a source of danger in blustering weather. If too heavy, they are dangerous if the motor is stalled. But all these relations between monoplane and biplane are subject to change the moment the stabilizing tail becomes superfluous; that is, when means are found for equalizing pressures under broad planes or planes placed tandem.

The principal requirement in this respect must be to break up the irregular eddies which are known to form under broad planes, or, rather, to cause them to be formed as a large number of small and well-distributed eddies of resistant air, instead of as unruly little tornadoes shifting from one point under the plane to another. And it seems instructive to note that irregularity is most pronounced under flat planes and under broad planes, while curved planes and narrow planes are more manageable. A strongly curved plane may be made broader than is advisable for a plane approximately flat. This has been abundantly demonstrated to hold good for present conditions, and furnishes a clue for the inventive faculty.

In the writer's opinion—and doubtless the same idea works under shroud of silence in many other minds—planes will eventually be made to consist of a rigid front portion, comprising about one-third of the plane's width, and a larger, more or less elastic rear portion, capable of yielding to excessive local pressures and causing the center of support to be maintained steadily under the rigid front portion, and that about one-half of the area of the planes will be covered with small, shallow air pockets, which will take the place of pronounced curving of the whole plane, without involving nearly so much air resistance against propulsion. A development of this description, while not plainly foreshadowed in the facts so far ascertained in connection with the flight of aeroplanes, is consistent with all these facts, inasmuch as none of them excludes it.

The monoplane when no longer requiring to be ballasted by means of a tail to prevent it from pitching, will be the natural small-size and light-weight flier. It may readily be made compact for storage, and fast, but no reasons have ever been offered for abandoning the belief that the biplane will always be the better carrier of weights. Bridge construction presents a parallel which few engineers would consider short of conclusive in this respect.

While on the point of probable improvements in the fundamental characteristics of planes, whether for monoplane or biplane machines, it seems necessary to call upon the soaring bird to furnish contributory evidence to the effect that some one law closely related to aeroplane action still remains unrevealed and unapplied. On the basis of accepted theories, only a rising air

current can explain soaring, and the explanation is very lame at that, weights and speeds of birds and air currents all considered. But then comes, moreover, the fact that small birds cannot soar; that is, not without previously gained momentum. And, in small birds, the wing and tail area is larger in proportion to their weight than in large birds. Soaring should be easier for a small bird, such as the swallow, than for the buzzard or the stork, if the accepted explanation were complete. On the other hand, if the explanation is insufficient, fundamental improvements in planes, imparting to them something akin to capacity for soaring, must be possible, and must eventually be developed.

Most analogies between birds and aeroplanes are unscientific, as when the shape of a bird's wing is imitated in the planes. The lack of essential similarity in methods of flight and properties of materials vitiate the comparison. The dihedral angle, as in Latham's monoplane, is praised as safe on the ground that many birds sail with their wings held V-like. Dissection, however, lays bare, in some birds, a bony projection which offers a simple mechanical explanation of the V-shape as one which can be maintained without muscular effort.

The concentration of weight at the middle of an aeroplane seems to be an unconscious imitation of bird construction, since it is evident that the biplane truss, resting on air with its entire length, would be stronger, or could be built lighter, if weights were more evenly distributed, and that it would also be more steadily balanced in the atmosphere, as a gust of wind, attacking one end of the structure, would not find so long a lever for upsetting the machine.

The required strength of the machine, when resting or propelled on the ground, rationally calls for a construction balancing the weighty parts over the skids or carriage foundation. By broadening this base, the engine, fuel supply, passenger load and propellers could be disposed of, as now done only in Wright biplanes to some extent, so as to increase the strength or reduce the weight of the structure considerably, though the builder would also have to consider the uniform distribution of air resistances.

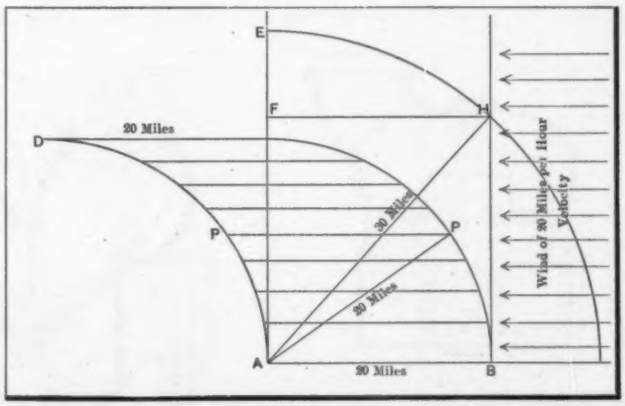
Fluttering or an apparently unstable or imperfect equilibrium during flight may be due to the use of flat ailerons for steering purposes, to lack of rigidity in the front edge of planes, to flat and rigid lift rudders, to lift rudders placed too low and out of line with the propulsion, to baggy planes, to operating flat planes at tilts above 15 degrees. Only under abnormally severe atmospheric conditions may it be due to a high center of gravity.

The Dirigible Balloon Without Gas

Every improvement of aviation machines which cleave the atmosphere alike to the bird, reduces the ultimate value of dirgible balloons, as the common-sense mind has already easily perceived without technical demonstration, but for the present the buoyancy of the dirigible still lends it certain advantages of safety under difficult weather conditions and possibly some superiority for reaching very high altitudes. These have endeared it to the military authorities, and its capacity for carrying considerable loads or a number of persons with much more body comfort than the aeroplane affords, has been so prettily developed in the Zeppelin type as to keep the question of the further perfecting and utility of dirigibles alive and open.

By arranging the great bulk of his buoyancy chamber in highly elongated form and adopting mammoth dimensions as the only means for attaining a rigid construction in combination with a low specific gravity, Count Zeppelin seems to have almost exhausted the possibilities of the dirigible balloon as a traveling machine, and by compartment division of his gas reservoir—much facilitated by its rigidity—safety has been much increased. It is hardly consistent for constructors of aviation machines to pooh-pooh the competition of the Zeppelin type of air craft, on the ground that it will never be able to navigate with any considerable degree of independence of currents in the atmosphere in which it is suspended and of which it forms a part by its bulk and buoyancy. It is easily demonstrated by a diagram that a Zeppelin machine capable of just holding its own against a headwind blowing twenty miles per hour cannot do any better against a sidewind of the same velocity, contrary to common opinion which credits it with a capacity for tacking up against unfavorable air currents. As the diagram shows, this capacity only begins when the speed of the machine is superior to the velocity of the wind. But a salmon, for example, that braves the currents of the Columbia River and even jumps against cataracts, affords a striking demonstration of ability to navigate though completely suspended in a medium of the same specific gravity as the operating machine. The questions involved are only those of power and strength of construction. The salmon has these properties in relation to water, and the dirigible balloon may acquire them in relation to air. If Zeppelin's propellers were twice as efficient as they are, his machine's ability to navigate against air currents would be immensely multiplied, provided the envelope of his reservoir would be able to withstand the much increased pressures to which it would be subject.

The engineering possibilities of the dirigible are, consequently, still attractive, and new ideas in this connection are not to be ignored. One of these relates to the use of a partial or nearly complete vacuum to take the place of gas. This budding idea is strictly a development from Zepperlin's success in attaining rigid construction without excessive weight. It is reasoned that it should be no more difficult to make the panetela-shaped reservoir strong and tight against an evenly distributed crush from the atmosphere—with diminishing pressure in the upper strata as an important incidental advantage—than to give it the properties required for holding hydrogen and at the same time rigidity against wind pressures. The vacuum would remove the danger of conflagration now due to the proximity of a hot engine, hot exhaust and possible gas leaks, and, most important of all, the buoyancy could be produced or enhanced by the engine power in any place, independently of such special facilities as are required for filling a balloon with illuminating or hydrogen gas. A semi-vacuum would be about equal to illuminating gas as a buoyant and would involve a pressure of only 7½ pounds per square inch. Leaks would be less liable to occur with pressures converging to the axis of the construction than in the gas balloon in which the pressures radiate from the axis and tend to expand materials. And a construction capable of withstanding 7½ to 15 pounds of pressure from without could probably be conveniently kept tight by repair work carried on while the structure is in the air, and any desired degree of vacuum, even varying according to the altitude, if desired, could be maintained by connecting exhaust pumps with the engines. From another source it is suggested that some of the methods employed for producing liquid air would be found of advantage for exhausting air from the reservoir.



Action of dirigible in side wind, of 20 miles per hour. Maximum speed supposed to be 20 miles per hour, and machine headed for any point as P in curve B C, but after one hour of travel it can do no better than reaching the corresponding point as P in curve A D. But when the speed of the dirigible is increased to 30 miles per hour, it can be headed for point H, and will land at F, after one hour; and F is in the desired direction of travel.

Adjusting the Carbureter—for the Novice

By HERBERT L. TOWLE

ADJUSTMENTS are many and various, hence it was an impossibility to close the subject out last week, in fact, it was cut off somewhat abruptly in the midst of a discussion of springs, spring winding and spring tensions. This subject is of vital interest, for not only does the amateur want to know about it for repair purposes, but a full knowledge of it will avail for correcting defects in springs sent out by the makers, as well as helping very materially in case of trouble, in that it allows one to make a better and more rapid diagnosis of the trouble.

In winding a new spring with more turns, it is best to start with too many and shorten the spring by degrees till it is right.

In the foregoing it has been assumed that the float has been correctly adjusted. It is wise, however, to satisfy one's self on this point before altering the spring. A slight drop or bead of gasoline on the spray orifice is permissible when the car is at rest on a level floor. If the level is too low, extra suction will be needed to lift the gasoline. If, however, it is too high, the gasoline will drip. Changes in the float valve adjustment must be very carefully made, as it is very easy to over do them, particularly when the float has a long leverage on the valve. Instead of adjusting the needle valve to raise the gasoline level, one may add weights to the float. If the float is hollow copper or brass, it is easy to add a drop or two of solder. If the float is cork, a bit of lead or brass may be screwed to it and shellacked over to prevent gasoline from soaking into the cork. If the float is of such form that a single weight will cramp its action through lack of balance, two or more weights equally spaced around it should be used.

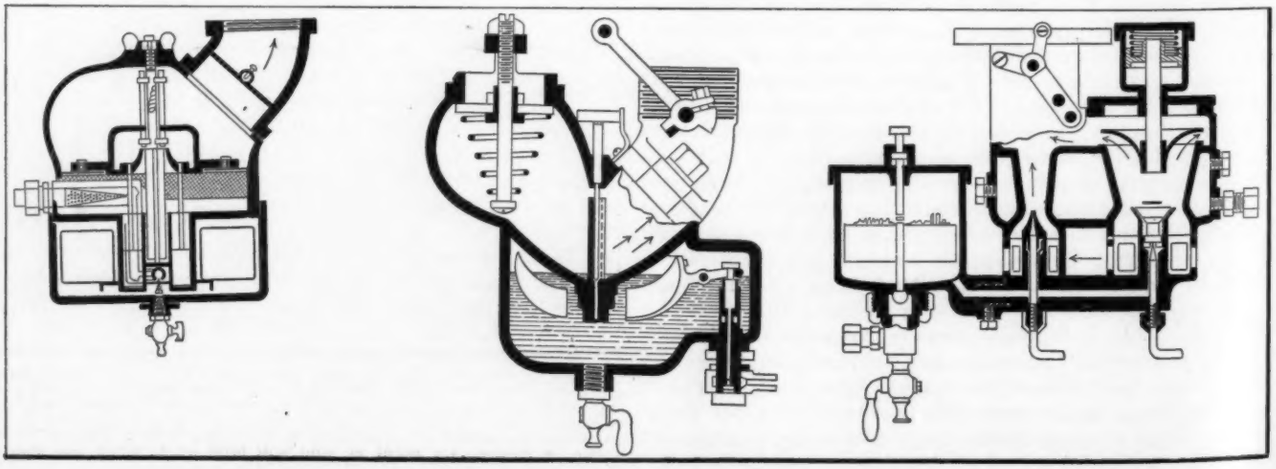
Many carbureters have the float annular and surrounding the spray chamber. The object of this is to prevent tilting of the carbureter on changing the gasoline level at the nozzle. Where the float chamber is offset from the spray chamber it is preferable to have the float chamber forward of the spray chamber, so that the gasoline level in the latter will be higher when going up hill. This will automatically increase the gasoline supply on grades when it is most likely to be needed and reduce it down hill.

To avoid the complexities of the automatic air valve, some carbureters are made with the diluting air inlet connected directly to the throttle, so that opening the throttle opens the pure air inlet. With this arrangement the pure air is not admitted till the throttle has begun to open, so that with a low throttle opening all the air comes past the spray nozzle. Fig. 1 is an example of this type. The throttle serves a double function, uncovering the pure air inlet at one end. The air thus admitted goes through the body of the throttle, which is annular in shape, and mingles with the carbureted stream at the throttle opening. The difficulty with this type of carbureter is that it does not take account of the varying degrees of suction possible to an automobile without change of throttle opening. For example, one prefers the throttle wide open when going up hill, but to open it wide in the carbureter just mentioned would be to dilute the mixture excessively. Again, when running down a slight grade with the throttle barely open, the mixture would be too rich.

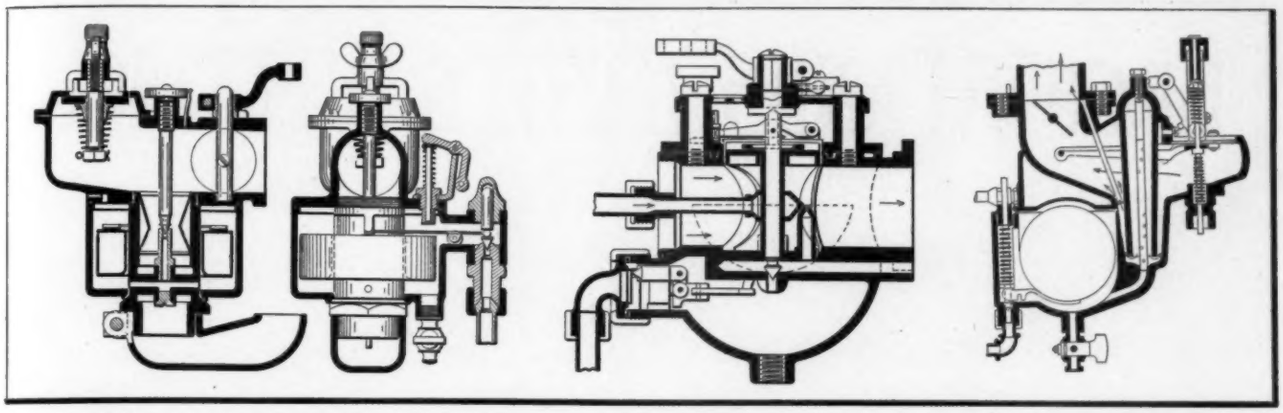
What is known as the puddle type of carbureter has been offered in the last two years, as an escape from the complexities of the air valve carbureters with three or four adjustments. In this carbureter the float is annular, and the mixing chamber is U-shaped with its lowest point constricted and depressed into the center of the float chamber. An orifice at the lowest point of the mixing chamber permits gasoline to come up into the latter, forming a small puddle when the engine is at rest, whence the name of the carbureter. A needle valve controls the orifice, and the float is adjustable to regulate the gasoline level, and therefore the depth and size of the puddle. There are no other adjustments, and all the air passes through the single U-shaped mixing tube.

The theory of this carbureter is that at low speeds no suction is required to feed the gasoline, since gravity tends to keep the puddle full. The liquid gasoline in the puddle is swept upward and along the walls of the induction pipe, and evaporated on its way to the engine. At medium speeds the puddle is wiped out, but the flow is still assisted by gravity. At high speeds the action is practically that of the ordinary spraying type. In practice, carbureters of this type work very successfully through a limited range, which perhaps is as great as the range of the average engine. If, however, the engine is exceptionally flexible its demands may exceed the automatic range of the carbureter, with the result that the mixture is strangled and overrich at high speeds. If a larger carbureter is substituted, it works well at medium to high speeds, but not at low speeds, owing to the gasoline and air not being sufficiently mingled. By attaching an auxiliary air valve to the intake between the carbureter and the engine this limitation is overcome. In other respects the carbureter is extremely simple and easily adjusted, although considerable nicety is required in getting the gasoline level exactly right.

The foregoing paragraphs have dealt only with the absolute proportions of gasoline and air, and have assumed that whatever gasoline the carbureter delivered was diffused and burned. In reality both of these assumptions may be wide of the truth,



Group of Modern Carbureters, Showing the Variations in Construction. Duryea, Bennett and Willet



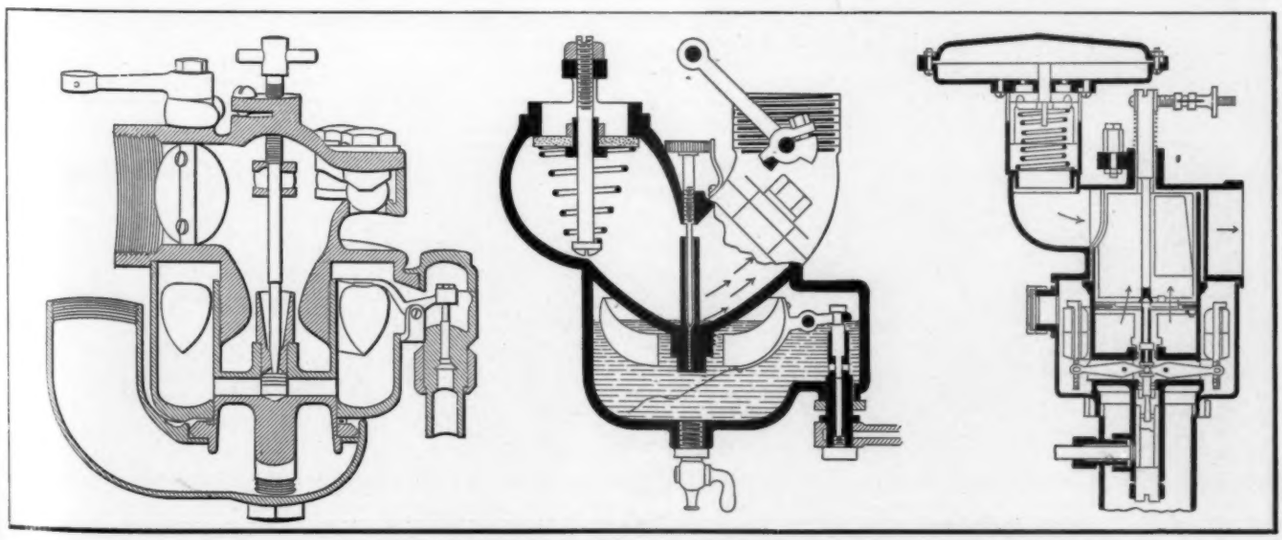
More Examples of Modern Carbureter Construction. On the Left Breeze. On the Right Carter. Between Anderson

especially in large carbureters with a single spraying orifice. At low speeds the gasoline may not be properly broken up by the air stream. At high speeds, while broken up, it may not have time to evaporate and diffuse. It is certain that with a large proportion of the carbureters in common use some of the gasoline fails to find its necessary quota of air for combustion, and therefore goes through the engine unburned. The first difficulty, that of atomization, is partially met by having two or more separate spray nozzles of graduated sizes, of which first one, then another, comes into action. Such a carbureter was shown in Fig. 4, last week, in which *A* is the main throttle and *B* the auxiliary throttle. The two throttles are linked together in such a manner that *B* remains closed till *A* has opened sufficiently to take as much mixture as the small spray nozzle can furnish.

The question of converting liquid gasoline into vapor and commingling the vapor with the air is not simply a question of atomization, but also of heat. Gasoline evaporates rapidly, but it absorbs heat on doing so. So far as it is in spray form this heat is readily supplied by the air itself; such, however, of the gasoline as forms a film on the walls of the induction pipe is best evaporated by heating those walls, and the conventional water-jacket of the carbureter itself is by no means sufficient for this purpose. Recently various automobile builders have adopted the idea of drawing the mixture through a cored passage in the cylinder casting on its way to the intake ports. A still better plan appears to be to introduce the diluting air after the gasoline vapor and primary air stream have been thoroughly mingled. This involves placing the auxiliary valve as close as possible to the cylinders, for example, at the branch of the intake manifold, with the throttle so placed as to compel intimate commingling of the pure and carbureted air streams. The pipe from the carbureter to the throttle is then hot water-packeted, or else the primary air stream itself is highly heated and a very rich mixture produced. The diluting stream is then sufficient to cool the mixture so that power will not be lost by needless rarefaction of the charge.

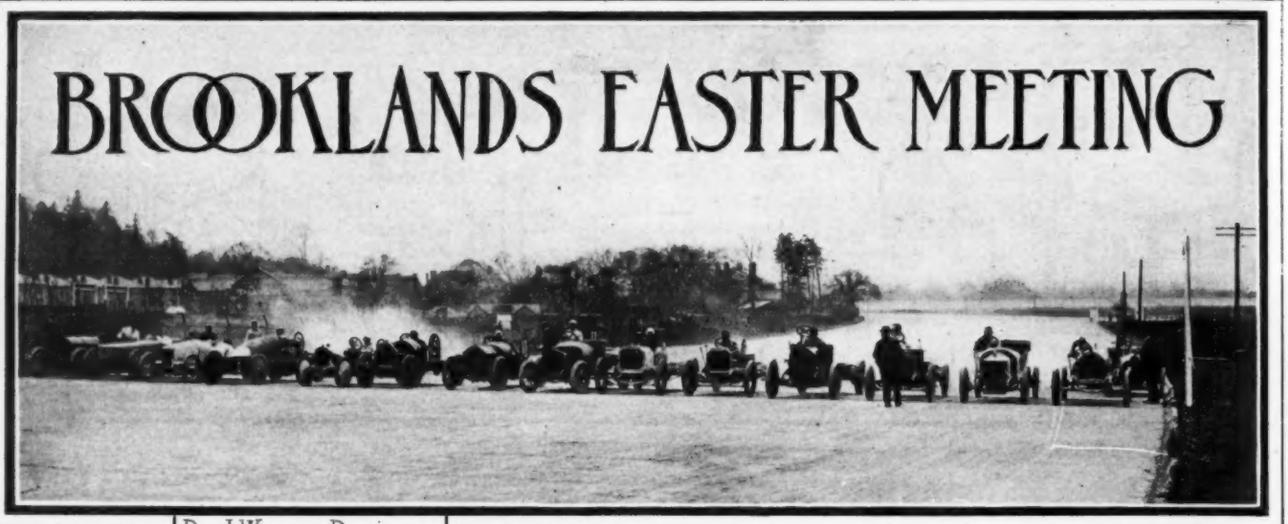
The problem of atomizing the gasoline has been approched from another angle in several devices comprising essentially rotating fan wheels which were supposed by their rotation to commingle the air and gasoline. The early devices of this sort appear to have been failures, for the simple reason that while the fan rotated the air column passing through, it did not. It would have been more logical and effective to make the fan stationary. Recently, however, the fan has been used in a different way, as a means of imparting rotation to a coarse-wire screen through which the mixture passes, and which by its violent rotation breaks up any liquid particles of gasoline impinging on its meshes.

Whatever the ultimate solution of the carbureter problem may be it is certain that much less gasoline will be found necessary than is to-day required by the average car. Such feats as the running of a 35-horsepower six-cylinder car 20 miles in an hour on a gallon of gasoline have been performed. We all know when our cars are tuned in some certain manner, whose exact theory we may be unable to trace, they will perform prodigies of flexibility and hill-climbing feats within a certain range of speeds. The carbureter of the future will certainly duplicate those feats through a much wider range of speed, as wide in fact as the construction of the engine is calculated to permit.



Kingston and Chadwick Illustrate a Number of Interesting Different Points in Carbureter Building

BROOKLANDS EASTER MEETING



Dr. J. Warren Davis on His Jackson Car

M. Hancock and His Vauxhall Winner of 4th and 6th Races

Full View of Hancock and Vauxhall Winner

LONDON, Apr. 2.—The first combined motor and aero race meeting was held at Brooklands track on Easter Monday, the combination bringing out a large and enthusiastic gathering. The flying machines had only one event, it is true, but five aeroplanes turned out, including monoplanes, biplanes and a single triplane. The winner was Mr. Maunders, who covered the half mile with his Bleriot monoplane in 52 seconds. Rather an ignominious ending greeted his performance, for just after passing the post, he collided with a large garden roller and smashed his left wing.

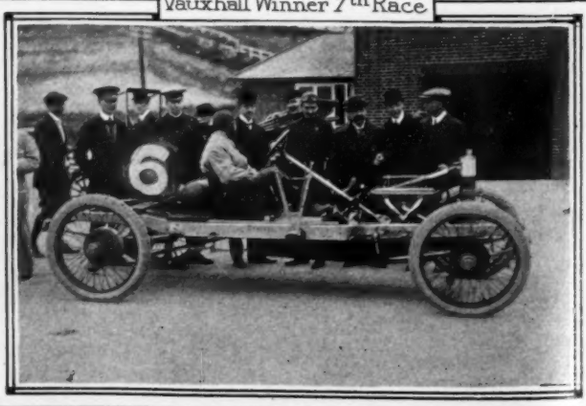
Of the car events, the principal features were the high speeds attained by the small cars and the general tendency toward the use of special boat-shaped bodies, in order to diminish the wind resistance. It was essentially a day for light 4-cylinder cars.

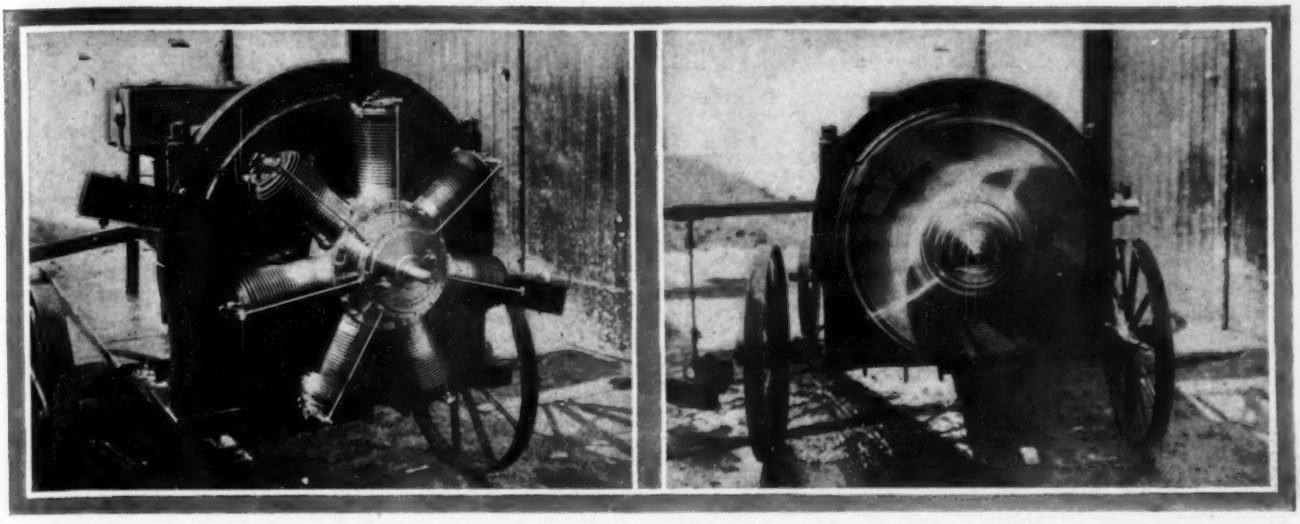
There were seven races, including the first and fifth, which were for motorcycles. The second was the Easter Junior Handicap, distance 5 3-4 miles, for cars of 25-horsepower R. A. C. rating and under. Then there were the Raglan Cup, 16-horsepower and under, at 8 1-2 miles; the March Handicap, less than 18-horsepower, at 11 miles; the Easter sprint race, at 2 miles, for cars which have been timed to do laps at a rate of 80 miles per hour, and the first 21 rating race at 8 1-2 miles.

The 20-horsepower Vauxhall (with four-cylinder engine, 90-millimeter bore) carried off two of the races, its best speed being 81 1-2 miles an hour. The next fastest winner was a 24-horsepower Vinot, which could only record 67 1-2 miles per hour.

Racing cars were conspicuous by their absence, and the only big chap to put in an appearance—a 120-horsepower Mercedes—spoilt its chance each time by a fierce clutch, which stopped the engine at the start.

H. W. Bashall on 20 I Vauxhall Winner 7th Race





Gnome Aeronautical Motor Being Tested Out of a Test Stand, Showing Peculiar Appearance at High Speed

A. C. F. Gives Up Its Aero Cla ms

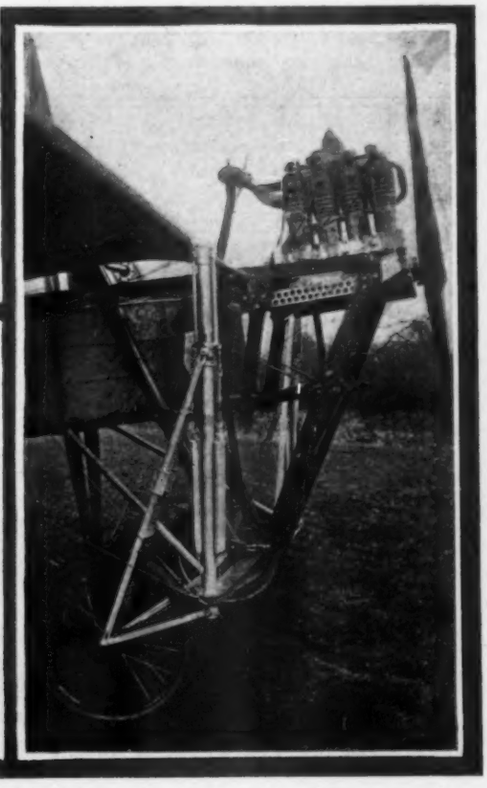
PARIS, Apr. 4—After securing a date on the international program for a big aviation meeting at Rheims, together with a cross-country flying match from Rheims to Brussels, the Automobile Club of France has abandoned the entire project. It has decided, however to devote the $40,000 originally promised as prizes to the encouragement of aviation, the sum of $30,000 to be given to the first aeroplanist flying from Rheims to Brussels, a distance of about 180 miles, and $10,000 to the first airship making the trip from Paris to London.

It is not merely a change of program that the Automobile Club has made, but a practical abandonment of its claim to be an aeronautical authority. It fought hard to get a date on the international conference for what was practically a second edition of the Rheims meeting. England wanted the same date for a meeting at Bournemouth and secured it from the International Federation, but the French authorities tried to overrule the Federation, persisting in their date and menacing aviators with disqualification if they took part in the English meeting.

Difficulties arose a few days ago when it was discovered that the committee of the Automobile Club of France has not voted the sum of $100,000 originally spoken of as prize money. Indeed it appeared that while the other organizers had been obliged to give guarantees that they possessed the necessary prize money, no such precaution had been taken with regard to the Automobile Club, although the promises had only been made on the authority of individual members. A meeting with $40,000 prize money costs at least $50,000 to organize, with a doubt as to this sum being exceeded in receipts. The club was not disposed to risk such a big amount, and in order to save its honor proposed to offer $40,000 for the encouragement of aviation, without organizing an event itself.

The offer has not been received very graciously. If the Automobile Club can withdraw after giving a formal promise to hold a meeting, there is no reason why any other association having secured dates should not offer its total prize money in one sum for a trip from Paris to Pekin. The airship prize will not encourage anybody, for it will be taken by either Clément or Lebaudy, both of whom are building airships for England which must cross the Channel before being purchased. Without an organizer at the back of the Rheims to Brussels race the event is not of interest. To win it will necessitate a sum equal to the prize, for a 180-mile flight cannot be made without serious preparations.

Dubonnet, Pilot of a Successful Monoplane, Known as Cellier



Cellier Monoplane, Showing Panhard Engine

Traffic Problems in Big Cities

IN VERY big cities, like New York, Chicago, and London, many of the problems of traffic, street cleaning, sewerage, and the like, which are insignificant in smaller places, become almost insurmountable. So, it is, in particular, with the traffic problem. Of the cities mentioned, London has perhaps taken up the automobile to a greater extent than any of the others. For this and other reasons, anything pertaining to that subject is always interesting to those connected with the automobile business.

Consul-General John L. Griffiths states that a suggestive report has just been published by a section of the British Board of Trade on a subject of perennial interest—London traffic. This leads Mr. Griffiths to review the subject:

The primary difficulty in handling the enormous and constantly increasing traffic arises from the manner of London's growth through the centuries. It was not laid out as Washington was, for example, according to a definite plan, but developed in this direction or that in response to the immediate pressing needs, and until recent times with little regard to future requirements. The result is an extremely picturesque city, but not one altogether adapted to the transportation needs of its vast population.

It is proposed now to make an extensive survey of the traffic necessities of the city, taking into consideration its possible future expansion with the view of establishing great arterial traffic thoroughfares for the purpose of relieving the congestion at the center, and of furnishing adequate communication between the center and the outlying districts. To show the need of such thoroughfares it is only necessary to mention that while there are 102 miles of boulevards and avenues 98 1-2 feet or more wide in Paris, London has only 8 1-2 miles; and while Paris has 42 roads radiating into the country, London, with a population twice as great, has only 20, and ordinarily they are narrower than the French roads.

The proportions of the London traffic problem are shown by the fact that 87,934 new buildings were erected in the county of London (the city embraces the entire county and portions of other counties) from 1897 to 1908, and by the further fact that in the same period 148 miles of new streets were laid out.

Additional Population—Passengers Conveyed

It is estimated that by the middle of the present year the population of greater London will number 7,500,000 people, of whom 4,873,000 will dwell within the county of London proper, and 2,627,000 outside. Upon a conservative estimate an annual addition of 100,000 may be expected to this population.

The experience of London is similar to that of all other great cities in that for many years past the population of the outer area has been increasing much more rapidly than in the central districts, and the difficulties of the traffic situation have been thereby seriously augmented. The following table shows the number of passengers carried from 1903 to 1908, inclusive, on the local railways, tramways, and principal omnibus lines, together with the average yearly journeys per individual:

Year	Local railways	Tramways (approximate)	Omnibuses (principal companies)	Journeys per head
1903	290,722,680	394,356,531	287,386,471	142.9
1904	298,638,750	431,813,839	288,965,214	147.6
1905	305,052,495	477,944,684	290,665,051	153.2
1906	329,521,648	508,700,269	291,563,048	158.8
1907	356,233,666	589,745,792	275,479,000	169.2
1908	399,666,339	638,013,841	340,000,000	188.1

It will be seen that the total number of passengers conveyed in 1908 was 1,377,630,180, as against 972,465,682 in 1903. The total number of passengers carried in 1881 was only 269,662,649. These figures, however, are not complete for they do not include the cab traffic, nor all of the omnibus traffic, and neither do they cover the great suburban traffic of the trunk railways.

Suburban Movement—Residential Figures

The average length of the individual journey is increasing as people move farther and farther out. The development in the facilities of transportation have not kept pace with the growth in population, and the time is approaching, it is predicted, when the increase of travel and the outward movement of the popu-

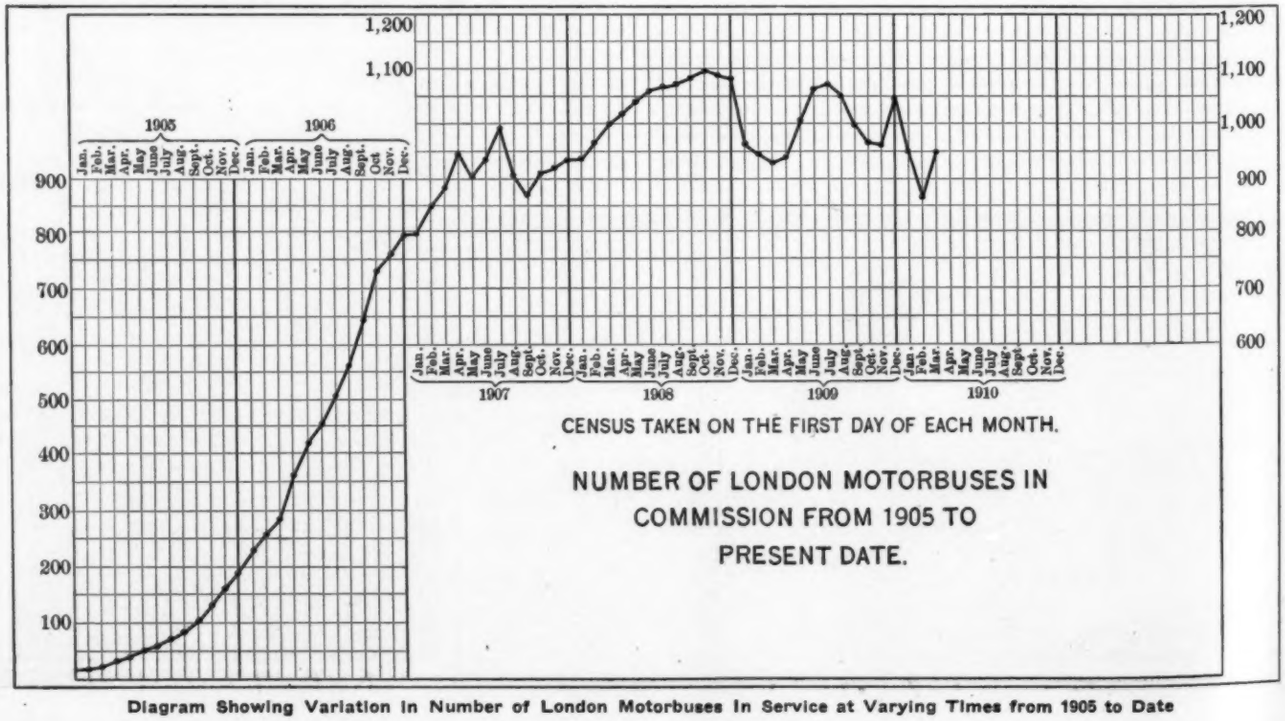


Diagram Showing Variation in Number of London Motorbuses in Service at Varying Times from 1905 to Date

lation will each be checked unless provision is made to keep such facilities abreast with the growing demand.

While there were 43,538 empty houses and tenements in 26 of the 28 metropolitan boroughs of London in August last, there has been phenomenal increase in the population—in the past decade especially—of almost all of the outlying or suburban districts. The table below shows the shifting in traffic during the last few years, the figures given being those for eight selected points in a single day in a thickly populated residential portion of the city of London:

	1903.	1905.	1908.
Two-wheel cabs	5,114	5,260	5,042
Four-wheel carts	15,543	16,994	19,665
Private horse vehicles	43,790	47,833	29,967
Horse omnibus	32,790	32,661	15,216
Motor omnibus	.....	537	10,914
Cycles	7,509	11,717	13,002
Private motor cars	1,064	3,260	6,961
Commercial motor cars	168	219	1,163
Taxicabs	.....	.....	19,718
Total vehicles	105,978	118,481	121,648
Foot passengers	354,983	309,137	329,985

The significant feature of this table is the striking increase in five years of the use of motor omnibuses, private motor cars, commercial motor cars, and the taxicabs.

Tramways Versus the Motor Bus

Tramways, as far as London is concerned, it is believed, have practically reached their limit of development, but the motor omnibus is probably only in its infancy. In narrow streets the speed of the tramway is greatly reduced, and municipal authorities, it is stated, have been compelled to appeal to ratepayers to patronize their own tramways. In the case of the omnibus, if a certain route is not remunerative, a transfer can be made to another line of travel, and it is in every respect more adaptable to London conditions than the tram car. The report of the British Board of Trade states:

> As rivals to tramways motor omnibuses are likely to become more formidable than hitherto, since they will be cheaper to work and will travel longer distances. Tramways have long since reached a stage at which there would appear to be little room for further improvement either in efficiency or cheapness. Motor omnibuses, on the other hand, are only beginning to show their capacity for dealing with traffic in large volume, and there is still an ample margin for improvement.

The most radical improvements being made in the tramway systems of greater London are the electrifying of the horse-car lines and the introduction of through booking. The report concludes:

> There is every reason to anticipate that the conveyance of passengers and goods by road will continue to increase largely and that the improvements in the construction of motor vehicles of all kinds, the lowering of their cost, and the reduction in working expenses will hasten the supersession of animal transport, which has already made conspicuous progress. Motor vehicles have won their way on their merits in the face of the difficulties incidental to the employment of new and untried machines, and that they should have already displaced horse vehicles to a large extent is clear evidence of their superiority as instruments of transport. The conditions of profitable working are now well understood, and many who have hesitated to discard horse vehicles may be expected to replace them with motors as they wear out.

Notwithstanding what has been said in reference to tramways, there is a feeling that with the broadening of some of the principal highways and the construction of new roads of greater width their usefulness will be more generally recognized than at the present time, and that under these circumstances they may come into greater competition with the motor omnibuses. On the other hand, the latter show an increasing popularity.

Data of Acceleration and Braking Tests

ENGINEERS are usually such busy men that little opportunity is offered them for original tests and other research work. So it is that there is a marked scarcity of data available on the pert subject of acceleration and braking tests of automobiles. For this reason any scrap of knowledge pertaining to this subject is carefully treasured, and with that as an excuse, the following remarks from an English contemporary (*Motor Trader*) are reproduced:

A correspondent has given some data from measurement tests of acceleration in starting and of retardation by braking that have some interest to the motor vehicle user. The writer tested steam and electric tube trains and tramcars, as well as motor buses and motor cabs. The readings were taken from an Elliott accelerometer and due allowance was made for gravity effect whether for starting or stopping. On the motor-omnibuses tested the starting acceleration varied considerably, but a typical case was 2.5 ft. per sec. per sec. on the first speed, 2.0 on the second, and 1.5 on the third. In each case the acceleration fell off quickly as the omnibus gained speed. Motor cabs, the author says, start at almost any figure, and the effect is more of the nature of a jerk than a steady acceleration. This is due to the sudden liberation of the kinetic energy of the rotating clutch and engine parts when the clutch is let in. The maximum steady acceleration observed was 4.0, but it rapidly fell to 2.0 and more slowly from that figure as the cab got up speed.

The starting acceleration of motor cars of high power was found to be more difficult to read. The acceleration was determined by measuring the time taken to get up to a definite speed (as read on the speedometer) and by dividing this speed (in feet per second) by the time taken in seconds. The resulting figure was the average acceleration in feet per sec. per sec. With a touring car fitted with a limousine body, the average acceleration at starting was found to be about 3.0, but on a light five-seated car figures as high as 7.0 were read, though, of course, the acceleration only remains momentarily so high as this.

On a London County Council electric tramcar the starting acceleration was found to be 3.0. The steam trains tested were found rarely to start with a greater acceleration than 0.6 ft. per sec. per sec., which forms a considerable contrast to the 3.0 ft. per sec. per sec. which will often be observed in the electrified (London) District Railway. On the "tube" railway trains the maximum acceleration reading was found to range from 1.6 to 2.4, thus illustrating the modern tendency to increase starting acceleration. Though less than that of the railway mentioned, the writer says that this acceleration is neither maintained, nor is it uniform for train and train. As regards the braking tests, it was found that for every class of vehicle tested the retardation rate was greater than the starting acceleration rate, which indicates that the stresses on the transmission gear by braking are greater than when driving at full power. Motor cars, for instance, have a retardation effect as high as 10 or more, while for motor buses it averages 3.0. For steam trains (presumably the data refer to the rails when dry) the rate is from 2.0 to 3.5 ft. per sec. per sec. On "tube" railways the maximum rate due to the brakes—for it has to be remembered that the rails' level rises and falls entering and leaving a station—is between 4 and 4.5, and on electric tramcars 1.5 to 2. The quality of the motor road vehicle's braking power is sufficient to explain why such vehicles are so prone to skidding.

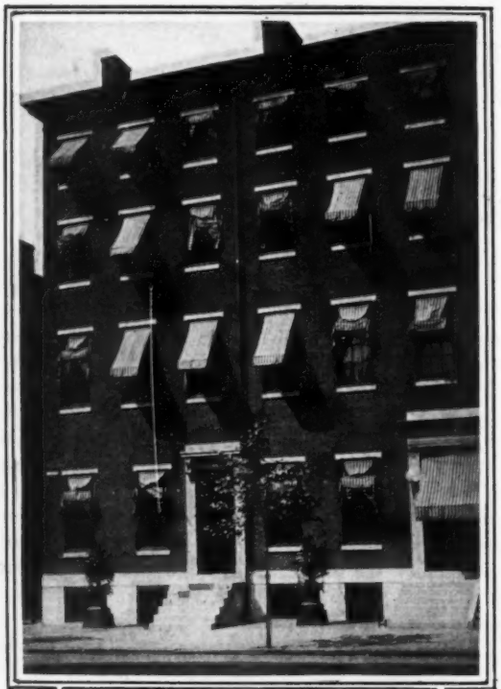
Heavy Muck on New Testing Track

The Great Western Automobile Company has constructed a half-mile track on the company's property at Peru, Ind., for the testing of its chassis.

The track is so constructed that the test cars have to pull through very heavy muck, which gives the car an excellent trial.

AUTOMOBILE CLUB of PHILADELPHIA

Proposed Club House and Garage



Present Quarters

THE pioneer motoring organization of the Quaker City, the largest body of its kind in that part of the country and one of the largest in the United States, is the Automobile Club of Philadelphia. Without any fixed sporting feature, save the Brazier trophy run, which has expired by limitation on account of the permanent winning of the plate by one of the members, the club has rolled together a membership of nearly 1,100, and thus presents a formidable force in the field of influence as a legislative factor.

The club roster includes the names of many of the leaders of the Quaker City in finance, business, professions, and in the social world. Its single object is to advance the cause of the automobile as a pleasure vehicle, and under this general principle all the various heads and subdivisions of activity in the interest of the automobile are included.

The automobile trade is subordinated to the automobile in the life of the club, despite the fact that an appreciable section of the membership is identified with that trade. It is said that many of the members who are now engaged in the automobile business have become so since they became members of the club, and that it is their interest in motoring and their ownership of automobiles, rather than business considerations, that holds them.

But the work of the club is strictly businesslike. The cozy little offices at Broad and Locust streets fairly teem with activity all day long. Obliging officers are on duty throughout the day to dispense route directions, touring data of detailed character, information as to accommodations of hotels and garages at any point within the sphere of activity of the club and also in issuing New Jersey licenses and permits that are recognized in other neighboring States. The present quarters are small, consisting of only three rooms, but the club contemplates building a home in the near future that will rival anything of the sort in the world.

In some central location, probably not far from Broad and Chestnut streets, the Automobile Club of Philadelphia is laying its plans to build a clubhouse and garage which will cost $400,000. Of this vast sum $200,000 has been provided by a tentative first mortgage and the remainder is to be raised by a bond issue bearing 5 per cent. interest, which will be sold to members of the club and others who may become members.

Already $66,000 has been actually subscribed, and practically all of the subscribers have expressed a willingness to double the amount of their bids. The bonds will be dated April 1, 1910, and will fall due October 1, 1940. The total amount of the issue authorized is $300,000, but it is provided that only $200,000 will be sold at this time. The bonds are coupon securities, the interest coupons being payable semi-annually. The denomination is $500. The club retains the privilege of redeeming the bonds April 1, 1915, at par and accrued interest.

The site of the new clubhouse will contain about 25,000 square feet of ground, upon which will be erected a five-story building in which will be embodied the most advanced ideas of construction. Space will be provided for 300 to 400 cars. The garage will be open continuously, and will be available at all times to members. According to the plans, the most modern equipment and machinery will be installed. Devices for measuring gasoline and oil, facilitating accuracy in accounting and rapid delivery, vacuum cleaning, storage of oils, compressed air for tires and other facilities will be included in the equipment of the garage.

Another feature of the clubhouse will be its chauffeurs' bureau. This enterprise has been started already, but in the new quarters it will be developed to a much higher degree. There is always a demand for trustworthy and competent drivers and chauffeurs, and it is the practice of the club to get the men to register and submit references. These references are carefully investigated and when the name of a chauffeur is listed by the Automobile Club of Philadelphia, prospective employers have the satisfaction of knowing that those men whose names are presented are thoroughly reliable. The drunkard and the careless driver who has been mixed up in joy-riding or who has capsized, damaged or destroyed a valuable car will be at a disadvantage in securing employment, while, on the other hand, those whose records are clean and show efficiency will have a much broader field.

A machine shop of the highest type will be provided for the use of members, where any sort of repair work, construction or experimental research will be undertaken at moderate cost. A feature of this department will be a section devoted to the members' chauffeurs, as a repair room.

The club's supply department, acting as agent for members, will provide all supplies at club prices, and will ship supplies out of town on order of any member requiring such service. The club garage will be run strictly on the "no-commission" basis, which will undoubtedly prove a refreshing innovation.

The reasonableness of the big plan has been amply demonstrated and worked out in detail by its projectors. It is estimated that there will be at least 300 cars stored in the garage by members. The present facilities for garage work in Philadelphia are lamentably deficient, and the club looks for even more business than is indicated in the foregoing estimate. But on that basis and charging the very moderate figure of $20 a month, the income would be about $72,000 a year. The estimated profits on repairs, accessories, oil and gasoline are placed at only $22,500.

That would give a total income of at least $94,500 a year, and the expenses of the garage would be about $40,000. Deducting the fixed charges for paying the bond interest and taking care of unforeseen contingencies as they may arise, the balance would be sufficiently large to provide a sinking fund of $25,000 a year to pay off the principal of the bonds.

Aside from the garage, the clubhouse will contain elaborate quarters and accommodations. These will include a ladies' room, common room, lunch room, shower baths, library, map room, lockers and every other good feature of the modern clubhouse. The building will be of standard, fireproof construction, and will be of permanent and artistic value to the city for many purposes. No insurance will be necessary except for the cars themselves. On the plan thus formulated, the cost of maintaining an automobile will undoubtedly be lessened materially to members.

It is expected that the financial details will be completed this spring and that actual construction will commence before the end of the coming summer. The club intends to hold its next annual meeting March 15, 1911, in its new home.

As has been mentioned, the club does not go in for racing to any marked extent. The Brazier trophy, which was donated by one of the members as an award for the winner of a 100-mile tour, was the only fixture of the organization that might be deemed to be a contest. But some time this spring or in the early summer, a three-day road tour for the members is being arranged. One of the most popular of the tentative routes under consideration is a triangular course from Philadelphia to Wildwood; Wildwood to Atlantic City; Atlantic City to Philadelphia by way of Lakewood. One day would be spent on each leg of this triangle, and a most enjoyable tour would be thus afforded. Suitable trophies are being prepared for the winners. It is likely that the tour will be held in the early part of June.

One notable service performed by the club has been its map and sign work. The territory under its immediate jurisdiction consists of twenty-one arbitrarily formed sections, each 36 by 42 miles, and extending to Frederick, Md., on the southwest, to New York State line on the northeast. In ten of these sections immediately adjacent to Philadelphia the map work has been completed, and the detailed information digested and tabulated by the club. Work on the remaining eleven sections is progressing, and much has been accomplished in the way of placing readable signs at appropriate places on the roads.

On account of the strangely muddled state of the automobile laws, there is more or less friction between motordom and the authorities everywhere in the world, and in view of this condition the Automobile Club of Philadelphia makes a specialty of its legal services to its members. S. Boyer Davis, secretary-treasurer of the club, is its counsel, and during the past year he has been called upon to go to court in 125 cases wherein alleged violations of the law were at issue. The result of these prosecutions and court proceedings has been generally favorable.

In handling these cases, Mr. Davis was aided in large measure by the fact that the Automobile Club of Philadelphia has always striven to inculcate the fundamentals of courtesy of the road in the minds of its members. For instance, under the unwritten rules of the club governing the running of the Brazier trophy contest, the participants were required to stop their engines when approaching a nervous horse. They were also cautioned not to kill any dogs and chickens, and to preserve a fine, careful attitude with regard to human life and comfort as applied to pedestrians and other users of the roads.

The public is becoming familiar with these rules, and each month finds the pathway of the motorist a trifle easier as a result of the more cordial understanding engendered thereby.

The club was incorporated November 1, 1900, and was formally organized May 25, 1901. It is thus the first of the Philadelphia motor clubs in point of seniority. Its quarters were located in the Land and Title Building for several years, and May 1, 1909, the present rooms were secured.

The officers are: Powell Evans, president; Stedman Bent, vice-president; S. Boyer Davis, secretary, treasurer and counsel. The directors are the officers and Henry P. Baily, Jacob J. Seeds, D. Braden Kyle, W. O. Griffith, Howard Longstreth, Herbert Morris, W. W. Atterbury and Robert K. Cassatt. The standing committees are presided over as follows: Club Relations, Stedman Bent, chairman; Law and Ordinance, S. Boyer Davis; Touring Information, W. O. Griffith; Good Roads, Howard Longstreth; Membership, Henry P. Baily, and Club Garage, D. Braden Kyle.

Membership in the Automobile Club of Philadelphia includes membership in the A. A. A. and the Pennsylvania Motor Federation, the state organization which has been so active in working for the betterment of automobile conditions in Pennsylvania.

Slide Valve Engines and Drill Sizes

Editor THE AUTOMOBILE:

[2,232]—I have been much interested in the articles appearing in "The Automobile" from time to time relative to the sliding type of valve, as the Knight. Please tell me the date of your paper in which there was a description of this engine. I have seen it but fail to find it now that I want to refer to it. Will you kindly tell me also the drill sizes of the A. L. A. M. taps?

New York City. ARTHUR L. CARRON.

The Knight engine has been the subject of several articles in THE AUTOMOBILE in the past. First, in the Oct. 22, 1908, issue it was described fully, with reproductions of working drawings of the engine. Recently, it was treated from another and more recent viewpoint. This was in the issue of Feb. 10, 1910. In the latter, the lubrication system was analysed, and power curves from several thorough tests were given, showing by comparison the power from a Knight slide valve engine and an engine of equal or equivalent size equipped with the ordinary poppet valves.

Drill sizes vary with the number of threads per inch, because the latter alter the bottom diameter of the hole or belt, small threads having a larger root diameter for the same nominal diameter than coarse threads. The A. L. A. M. screw threads being all fine threads, call for different sizes than the regular or coarse threads. The sizes to use are as follows:

A. L. A. M. Standard.		Bottom Diam. of Bolt.	Drill Size.	Drill Size for U. S. S. Std.
1/4	28			
7/16	20	.375	23/64	Q, S, or 11/32
1/2	20	.435	27/64	3/8, 13/32, or W.
9/16	18	.490	31/64	7/16 or 29/64
5/8	18	.5525	35/64	31/64, 1/2, or 33/64
11/16	16	.6065	19/32	9/16 or 37/64
3/4	16	.669	21/32	39/64, 5/8, or 41/64
7/8	14	.7815	25/32	23/32 or 47/64
1	14	.9065	29/32	53/64 or 27/32

Results of Changed Gearing

Editor THE AUTOMOBILE:

[2,233]—In your answer to letter number 2,161, among other things you say, "In making the change it will be found that the lessened speed is not any too agreeable, etc." Please explain through the columns of "Letters Interesting, Answered and Discussed" what you mean by "not too agreeable," and how this change is brought about by the change in question. I do not understand it. I am having the same experience with my car, which also is geared 4 to 1, same as the car of Mr. Power. While it runs perfectly on the level road, it lacks the stick-to-itiveness when it comes to sand or hills. A. E. HACKER.

Monrovia, Cal.

Reference was had in the answer to the letter above referred to to the fact that when one has become used to a certain speed of car from many months or years' use of it, a change introducing a different and slower speed causes trouble, in that the owner or driver can not immediately adjust himself and his ideas of speed formed during the past use of the car to the new maximum pace beyond which it is possible to go. In short, after being used to traveling at, say, 20 miles per hour, it is hard to get used to going but 16 miles per hour with the engine going just as fast as before, this being the result which a change from a 4 to 1 reduction gearing altered to 5 to 1 would give.

Connecticut Laws, Horsepower, Etc.

Editor THE AUTOMOBILE:

[2,234]—In looking over the pamphlet of the Secretary of State of Connecticut regarding the laws of the State pertaining to automobiles, I note a proportionate deduction for time on auto registration fee after June, but none is mentioned before. Why this should be I do not understand. I cannot see why a deduction for the three months after January should not be made as well as for the three months after June. Could it be that the statute should have read January instead of June? And if this could be established as the intention of the legislator who drew the bill, could the courts of this State remedy the self-evident injustice? Another feature that I note is that some cars are rated by the manufacturers at a higher power than by the State and by the A. L. A. M. rating. For instance, Buick is rated by the manufacturers as 22 horsepower, while the State makes it 16 horsepower. And the Ford N is rated at 15 by the company, while the State rates it at 22 horsepower. Now, can there be this actual variation of working power or cars? The Ford Motor Company rates Model S at 15 horsepower and T at 20 horsepower, while the State calls both 22. If there is this difference in the actual working power, will you explain why? It has been remarked to me that small cylinders clog and do not give the actual power indicated by the A. L. A. M. as well as large cylinders. Will you inform me if this is a fact? What should be the size of the exhaust pipe of cylinders 3 3-4-inch diameter and 4-inch stroke? Would a larger stroke need a larger pipe?

Nichols, Conn. W. T. K.

In the language of the registration act mentioned, the idea is quite clear. The bill says: "An applicant who does not file his application until after the first day of June shall be entitled to a pro rata reduction in the fee for such registration calculated to the first day of the month in which the application is made." The intention is that every owner and driver shall register on January 1, being thus able to use his car for the entire year. If, through late purchase or otherwise, the owner does not file his license until the year is half over, he will then have lost the use of the State roads for automobile purposes for that half of the year or longer. Recognizing this loss, the State partly compensates the owner for this by reducing the amount of fee to be paid for that year by an amount proportionate to the number of months lost.

As a basis for the taxation according to horsepower, the State has selected the A. L. A. M. formula for rating. You will find on looking up the list and the exact statute language that this is there so stated (Sec. 2, Chapter 221, Public Acts of 1909). Since not all makers adhere to the formula, the advertised rating and the State rating naturally differ. As long as makers continue to overrate or underrate their motors, this will continue to be the case. The confusion in the case of the Ford models is but natural. However, the same bore and stroke are used on the N, R, S and T, so that the State would rate them alike.

Small cylinders, or, for that matter, large cylinders either, do not clog up. If well constructed, the formula power should be developed at the rated piston speed. Exhaust pipe sizes are proportioned on the basis of cubical capacity and gas speed, a figure being set for the allowable speed of the gas. This will determine the pipe size, and any alteration in the capacity or speed, such as a longer stroke, will of course change the result. If in the instance mentioned the stroke was changed to 4½, the size of the pipe should be increased, or else the gas speed will be greater.

One Man's Idea of Car Assembling

Editor THE AUTOMOBILE:

[2,235]—It seems to me that it will be a great draw on our resources to maintain the automobile. Other lines are doing poorly now, while the automobile only makes living more expensive. The people taking to the automobile business "soak" you all they can. We are handicapped for men that can make repairs, without extortion as to the prices they charge, those that know get positions with the makers, leaving only inexperienced men to help repair the automobiles. This is a case of the blind leading the blind. Repair men are incompetent, and their prices are unreasonable. Builders are putting their automobiles together in a hurry, leaving several faulty places to be looked after by the buyer. I would want to see my next automobile assembled so that things were not rushed and that the pieces were a perfect fit. Piston rings leak oil, others are ground away, coil has tin in it. Dampness prevents it from working. What we need is a bond of indemnity with each and every machine. SAMUEL ASHCRAFT.

Swedesboro, N. J.

About That Radiator Trouble

Editor THE AUTOMOBILE:

[2,236]—We are the manufacturers of all of the repair parts for the Northern, Wayne, and Queen cars, and have purchased patterns, drawings, and gigs, etc., from all of the companies that manufactured these cars, and the writer has noticed from time to time that there are inquiries and answers relative to cars for which we are supplying and repairing parts.

We wish to refer you to an article which was a question put to you by R. E. Heinish, of Newark, N. J., with whom I have had considerable correspondence, especially relative to the subject on which he was asking for information in your copy of February 17. You answered his inquiry on page 374.

Now I disagree with your information relative to the trouble Mr. Heinish has had with the water circulation. The radiators on all Northern cars were theoretically designed to more than take care of the amount of water necessary for cooling the motors installed in their several different models. The one in question is a 1906 model of car, of which there are some nine hundred cars in continual service, and I absolutely know that 90 per cent. of them are giving no trouble whatsoever with the heating of the motor. I have found in my four years' experience that the overheating was due in nearly every case to the water pump being worn, or the internal impeller wheel or blades becoming detached from the driving member. I find a few other cases in which heating troubles occur when the inner lining of the hose connections had become rotten so that the inner lining of canvas would fall down and clog the passage of water. Large pieces of this lining also became detached, and with the flow of water were carried into the radiator tubes and logged there, causing stoppage.

I have explained the above in numerous letters to many of our customers and also Mr. Heinish, and I will positively guarantee that the type of radiator with the same size inlet and outlet connections can be made to cool the engine if the water pump and water lining of the hose are put in first-class condition.

So you see I very much disagree with your advising Mr. Heinish or any other person owning this type of car to purchase a new and larger radiator, which will mean added expense and delay and in the end not rectifying the trouble.

We would be pleased to have you explain this in the next issue of "The Automobile." Thank you for the courtesy of doing same.

Detroit, Mich. AUTO PARTS MFG. CO.,
L. A. AUSTIN.

Attention of all owners of Northern cars, as well as Queen, Wayne and De Luxe cars is called to the above, the company having made the deal which gave them the De Luxe patterns, jigs, etc., since the above letter was written.

In one slight particular it is necessary to disagree with Mr. Austin, in that the radiators could not have been designed to "more than take care of the amount of water necessary for cooling the motors." This is but another way of saying that the radiators are too big. If this were so, the engines would run too cold, which, as is well known, they do not do. There is a great deal of difference between having just the right radiator capacity and having too much capacity, so as to lower the efficiency by running the engine cold.

Dispute Over Long Race

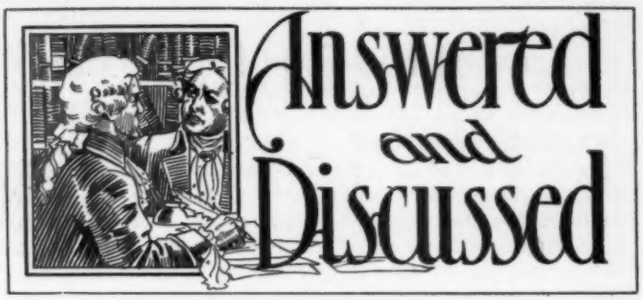
Editor THE AUTOMOBILE:

[2,237]—Please decide for me the following dispute: In talking about the race last season from New York City to Seattle, I contend that the Ford Model T car won the race and was awarded the race; a friend of mine contends that while the Ford was the first car into Seattle, it developed that the driver of the Ford had changed engines at some Ford agency and later the race was awarded to another car. Please set us right on this, and if another car was awarded the race, give make of car. C. H. MOULTON.

Beach, S. D.

Your friend was right. The Ford was the first car into Seattle, but was afterward disqualified, and the race awarded to the Shawmut car, which came in second. It was proved that the Ford changed an engine, just as your friend contended, and so the car was disqualified.

The ultimate winner, the Shawmut, was made in Massachusetts, by a firm which is now out of business or else just undergoing reorganization. But a very few cars of this make were ever turned out, and there were no spare parts to be had. Under those circumstances, it was a very courageous piece of work to enter the hard race and, moreover, see it through.



Winding for Magnetos

Editor THE AUTOMOBILE:

[2,238]—Will you please explain how to wind a magneto to obtain the best results for spark or ignition purposes? I have a three-bar telephone magneto. Do you think that it could be used or rewound for ignition purposes? I find that it will make a fair spark, as it was wound for a make-and-break spark. Then I would put on about as much more wire on the armature and it increased the spark a little. Wherein do the manufacturers of magnetos get their excess spark? Is it in the strength of the magnetic field or in the winding? About what size and how much wire should I use to make it strong enough for a spark plug or jump spark.

Geneva, O. E. S. SCOVILLE.

Since the number of turns of wire governs the number of lines of force cut by the turning of the armature, and the number of lines of force cut influences directly the amount of and intensity of the current produced, it is advisable, in order to have a high current, to make the wire as fine as possible and thus have as many turns as possible in the somewhat limited space at your command. Your experience has shown the truth of this, in that the slight additions made to the previous windings have shown a slight increase in the current produced. Kent says on this subject: "Knowing the ampere-turns required to produce the desired excitation of a magnetic circuit, the winding may be approximately determined as follows: For round cores under 1 in. in diam. make the thickness of winding equal to the core diameter, for cores over 1 in. let the thickness equal the cube root of the core diameter."

Take all of the wire off of the armature, then wind on new, good wire of the finest size obtainable, and see if the results are not more satisfactory to you. The mathematics of this question are very involved and so we have purposely avoided it, but if you should desire to have the matter worked out mathematically, we can and will do so for you.

Patentable Ideas of Value

Editor THE AUTOMOBILE:

[2,239]—Being a reader of your paper, "The Automobile," I take the liberty of asking your advice on a matter pertaining to improvements in machinery of an automobile. My inventions consist of suitable means for the prevention of upsetting, capability of turning the sharpest corner at full speed, and means for starting the engine without leaving the seat. I have traced my ideas on paper and would like to submit them to some experts or manufacturer, without running the risk of losing some or all of my efforts; also with a view of protecting my patents. Would you advise me in this matter? E. A. SCHULTZE.

Baltimore.

Your best plan is to advertise the devices, doing so without giving details. This will attract experts and manufacturers to the devices which you have. In the meantime, take out patents on each and every one which you consider worth the money (about $75 each), then with your patents applied for, you can go before the interested manufacturers or experts, and explain your constructions in detail, as the application for a patent protects you fully, providing only that the idea be new.

It would not be advisable to go very far with the details of the various devices, all of which appear to have some merit, until after you have protected yourself. The starting device, in particular, should be a very valuable one, if it will work. In default of finding anyone to take the matters up, and while waiting, the best plan will be to build a model.

Law of the Road, or Rules Governing Travel on Highways

By XENOPHON P. HUDDY, LL. B.

THE "law of the road" is constantly and more frequently being applied since the comparatively recent development of the automobile and the increase of motor vehicle travel on the public thoroughfares. Therefore it is proper that the automobilist should thoroughly understand what those rules are which make up the law of the road. We will first ascertain what the term the "law of the road" means.

DEFINITION OF LAW OF THE ROAD

The "law of the road" is a phrase used to designate all of the general rules by which travel on the ordinary land highways is governed.

ORIGIN OF THE LAW OF THE ROAD

Originally the law of the road constituted mere custom and it found its inception in custom. In England, for example, it became a habit for drivers of vehicles when meeting and passing to turn to the left, therefore, to-day there the rule is to turn to the left. This custom finally became so well recognized and established that it became a part of the common law, which later has been enacted into statute. In the United States, as everyone well knows, the rule is directly opposite to that prevailing in England, which is to turn to the right upon meeting and passing. Why, here in the United States, we adopted a different rule is not certain, although several explanations have been suggested.

It was out of custom, therefore, that this law of the road, embodying all of the rules governing highway travel, arose. Being the customary law it became the common law, and subsequently the States in this country expressly codified these rules to a certain extent.

RULES OF THE ROAD SHOULD BE SIMPLE

The law of the road is not complicated and should not be made too complex. If we are to make traveling on the public highways safe, the rules governing it must be extremely simple and easily and quickly to be applied. This is one argument in favor of automobile legislation which is not complicated. I am not now speaking of traffic regulations, which will be considered later on. One who drives an automobile should be so familiar with the rules of the road that they may be applied without thought. Still, thought should prevent their application when necessary, inasmuch as the law does not require the rules of the road always to be followed. In fact if a driver insists upon following the general law of the road when to do so would injure another, he is guilty of negligence, as it is his duty to deviate from the rule when occasion demands it; so it will be seen that the rules of the road are not fixed and, as an instance of this, I cite the case where one driver meets another and the one proceeds to turn out to the right to pass, but finds that the other driver is turning to the left to pass. In this case it is the duty of the former to turn to the left, if to do so will avoid a collision.

EQUAL RIGHTS ON PUBLIC HIGHWAYS

One of the primary rules to remember, and which is fundamental and at the basis of all rights on the public highway, is that all lawful users of the public highways have equal rights thereon. This means that the automobile, the horse-drawn vehicle, the street car and the pedestrian each equally has as much right to use the public highways as the other and each should respect the other's right. Neither has any superior right over the other and if one vehicle encroaches upon the rights of another it is done so unlawfully.

OVERTAKING AND PASSING

Another primary and general rule of the road is that overtaking vehicles should pass to the left of the preceding vehicle. As a corollary of this rule the preceding vehicle should reasonably and seasonably give way and allow an overtaking vehicle to pass to the left. The right of a preceding vehicle to pass one ahead is supported by a recent decision of the Court of Appeals of the State of New York, the first time this question has been squarely determined in this country. Quoting from the official report of this case, the following may be said to be the law:

"In the case of two cars traveling in the same direction the front one has the superior right and may maintain its position in the center of the highway if there is sufficient space on its left, as prescribed by the Motor Vehicle Law, for the approaching car safely and conveniently to pass. If the position of the forward car in the center of the highway does not leave room for passing, then it must, if practicable and convenient and upon request or equivalent notice, turn aside so as to make room. If at the time there is not sufficient space to do this, it may wait until a convenient place is reached. The circumstances might also be such that a jury would be justified in finding that it was extremely unreasonable for a slow-moving car to refuse to stop, if requested, and let the other pass."

Since the automobile has come into general use, other rules of the road have appeared, such as the necessity for giving a warning signal upon approaching a corner, particularly where the view is obstructed. Warning signals should also be given to call the attention of other users of the highways to the fact that the automobile is proceeding under circumstances where reasonable care demands the giving of signals.

STOPPING THE CAR

The law of the road has not solely to do with actual traveling. It is as necessary to be careful and cautious in stopping an automobile and remaining stationary as it is to proceed. There can be no monopoly of the public thoroughfares, therefore it is an infringement upon the rights of the public to stand in the street or on a road for an unreasonable length of time. Where traffic is thick the time is much shorter which is allowed for a vehicle to remain stationary. In leaving an automobile on the street, due care should be taken by the operator to leave it in such a condition that it cannot be started by intermeddlers. If due care is exercised in this respect no responsibility is incurred by the driver or owner of the machine if children come along and start the machine which, uncontrolled, runs into either a person or a vehicle on the public highway.

EQUIPMENT AN INTERESTING SUBJECT

Equipment also constitutes a subject which the law of the road controls. The equipment of an automobile must be lawful and to be lawful it must be safe. The statutes of the various States provide that brakes, lights, signaling devices, mufflers, etc., must be had. The term "equipment" was covered by the old common law by the term "good tackle," which was used to designate such articles of equipment as harness, buckles, shafts, whiffletrees, etc. A vehicle which is used and which lacks legal equipment or good tackle, if it collides with a person or other vehicle on the public highways by reason of it not having good tackle or legal equipment, legal liability will be incurred by the driver or owner. Proper lights should also be carried, not only on automobiles, but horse-drawn carriages should have them.

ROAD-WORTHINESS

Before leaving the subject of equipment and good tackle, it should be mentioned that the vehicle should be generally road-worthy. Road-worthiness covers in a general way the ability of the vehicle to travel and carry its load without danger to its occupants or others using the public highways. It has nothing to do with the ability of the vehicle to proceed. Whether or not an automobile is road-worthy is generally a responsibility which the manufacturer assumes toward the purchaser and it may be said that every manufacturer of motor vehicles warrants that the machines turned out by him and placed on the market are road-worthy. The warranty does not extend beyond the first purchaser.

WHAT THE LAW OF THE ROAD APPLIES TO

The law of the road applies to automobiles as well as horse-drawn vehicles. It does not apply in many of its particulars to street cars. They run on rails and cannot be steered away from the established track, but other vehicles must, however, pass street cars upon meeting and overtaking them, following the same rules that apply to other vehicles which have more freedom of control. Of course, an automobile should stop when the street car in front of it stops to let off passengers.

PEDESTRIANS, CHILDREN, ETC.

The law of the road does not, however, apply to pedestrians. They are not compelled to follow the rules which are embodied in the law of the road. People riding horseback also are not compelled to obey the rules of the road. Of course, the proper place for pedestrians to cross the street is at the regular customary crossing, although it is not negligence for a pedestrian to cross at other places, where it is reasonably safe for him to do so. It has even been held not to constitute negligence for a pedestrian to stand in the road and talk to the driver of a vehicle. In such a case it is the duty of approaching vehicles to look out for the safety of the pedestrian.

Particular care should be exercised by automobile drivers not to run down children who are playing in the street. It is to be conceded that children should not be allowed to play on the public highways; nevertheless, if they are there it is the duty of automobilists to look out for them, since their tender age cannot be held to exercise as high a degree of care for their welfare as in the case of adults. No amount of sounding the horn of an automobile or giving of any other signal will warrant or excuse running down a child or pedestrian.

The mere fact that the pedestrian is blind or hard of hearing will not excuse an automobile driver from negligently running into him.

Where an old man with defective eyesight was traveling south and met an automobile traveling north, and in attempting to get out of the way jumped toward the east and the machine turned toward the west, and the front hub on the east side struck the plaintiff, injuring him, it was held that the complaint was sufficient where it charged that they were riding in possession and control of the auto, and carelessly, negligently ran and operated the same at a high and dangerous rate of speed on the west side of the highway and knocked the plaintiff down and dragged him across to the opposite side of the highway and ran over him. It was also held that the complaint was not defective in not charging that they could see the plaintiff or that there was light enough to see him.

The rule that one must turn to the right on meeting another vehicle was held was not to obtain as to foot men. It was further held that it was not material on which side of the road the automobilists were driving. The evidence showed that they were aware of the presence of the plaintiff at a considerable distance from the accident; that they were driving at a high rate of speed, and that they did not change their course or slacken their speed.

To run an auto at a high speed toward a person, and so close to him that he is compelled or excited to flee from his path to keep from being run over, is an unreasonable abridgment of that person's right to the use of the road. It is claimed that one of the parties had nothing to do with the injury—that he was only riding in the auto and had no control of it; but the allegations of control in the complaint were not contradicted by the interrogatories and both parties were held liable. See Apperson vs. Lazro, 87 N. E., 97.

GENERAL RULES OF CONDUCT IN DRIVING

Aside from the express statutory rules governing travel on the public thoroughfares, there are general rules prescribed by the common law which should be followed. These rules are tersely and well stated in the following three paragraphs:

Every person driving upon the public highway is under a legal duty to observe, in the control and management of his vehicle, the exercise of reasonable care to prevent injury to others, and he is criminally and civilly responsible for the neglect or wilful failure to perform that duty. To create this responsibility, however, the law must cast upon the person sought to be charged the legal obligation to do the act or perform the service the omission of which is alleged to be the direct cause of the injury.

If persons having the control and management of a vehicle, in which they are riding along a highway behind another conveyance, knowing the danger of a collision with the forward conveyance and the probable consequences flowing therefrom, recklessly and negligently, or wantonly and wilfully, allow the vehicle to run down and collide with the other vehicle, without using such means as are reasonably at their command to prevent the same, they will be held criminally and civilly responsibile for the result of their negligence or wilful omission of duty. If it is the cause of death they may be convicted of manslaughter.

Where the driver of a vehicle is not guilty of negligence and a collision on the public highway is the result of inevitable accident, or resulted from the vehicle becoming unmanageable without his fault, and uncontrollable by the exercise of proper care, there can be no criminal or civil liability. See Belk vs. The People, 125 Ill. 584.

TRAFFIC REGULATIONS

In considering the law of the road we should not leave the subject without directing our attention to traffic regulations, which are more or less local in their nature, and govern the moving and progress of traffic more particularly in the large cities.

Municipalities possess the power to enact and enforce these regulations, since they are for the safety, welfare and convenience of all who use the public thoroughfares. Many of the regulations are merely declaratory of the ordinary rules of the road. As an example of a very good system of regulating traffic, I am inserting herein some of the regulations of New York City, which are as follows:

RULES FOR DRIVING IN THE CITY OF NEW YORK

All drivers of vehicles are required to comply with these rules in order to facilitate traffic, prevent blockades, avoid accidents and loss of life, and diminish the loss of time and money due to the lack of observance of rules for the regulation of street traffic.

A vehicle meeting another shall pass to the right.

A vehicle overtaking another shall pass on the left side of the overtaken vehicle and not pull over to the right until entirely clear of it.

A vehicle turning into another street to the right shall turn the corner as near the right-hand curb as practicable.

A vehicle turning into another street to the left shall turn around the center of intersection of the two streets.

A vehicle crossing from one side of the street to the other shall make a full 180° turn.

No vehicle shall stop with its left side to the curb except on established cab, hack and truck stands, and in streets where and when one-way traffic is directed by white arrow signs.

No vehicle except in an emergency or to allow another vehicle or pedestrian to cross its path, shall stop in any public street or highway, except near the right-hand curb thereof and so as not to obstruct a crossing.

SIGNALS AT TIME OF STARTING OR STOPPING

In slowing up or stopping, a signal shall be given to those behind by raising the whip or hand vertically.

In turning, while in motion, or in starting to turn from a standstill, a signal shall be given by raising the whip or hand, indicating with it the direction in which the turn is to be made.

Before backing ample warning shall be given, and while backing unceasing vigilance must be exercised not to injure those behind.

No vehicle shall be used on any street or highway unless provided with lights and sound signals as prescribed by law.

(*Continued on page 784.*)

THE AUTOMOBILE

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The labor problem in the centers of automobile activity is becoming just a little more acute every day and strange to relate, strike features are not prominent among the points with which makers of automobiles have to deal. In Detroit, for illustration, while there is a slight undercurrent which has a certain union labor sound, the fact remains that wages are high, hours are well regulated and conditions of sanitation are excellent.

The problems of magnitude are from rather unexpected quarters. Housing the men is becoming extremely difficult. There are not enough dwellings in Detroit for the men now employed, and more men are flocking to this center every day. It is not now unusual for men to pay $40 per month rent for dwellings that do not rate higher than apartments such as may be had in New York City for $25 per month, and while relief is approaching, as the result of extensive building operations, the fact remains that the automobile industry is growing faster than the accommodations.

There is another phase of the labor problem that will not "treat" so readily. Toolmakers are growing more scarce, relative to demand, every day. Machine tools are being ordered in excess of the rate of production thereof and a secondary complication comes in through the migration of toolmakers from the haunts of machine tools to the automobile plants. What really happens is this: Makers of automobiles order machine tools to suit their needs and rob the tool builders of their skilled workmen at the same time.

The railroad companies are now investigating Detroit in order to determine something of the freight-car requirement for this year. One commissioner, after going over the situation, stated: "If the tales I hear about production are half true there will be a freight-car famine." It is possible that the reports are half true because the commissioner's exclamation was premature; he became confused after visiting less than one-half of the live plants. It looks as if the transportation companies should do more building and less investigating.

It is not uncommon to hear men say that the expansion of the automobile business is confined to low-priced automobiles for popular consumption. This version should be taken with a grain of salt; there are relatively new undertakings that pass the $4,000 level, and in the light of experience these new efforts compare very favorably with $10,000 automobiles as they were had a year back.

Commercials are occupying a large amount of attention just at the present time. It is a healthy sign, and users of this type of car are beginning to see light. It is very likely that the commercial automobile will come into its own before the end of this year, and the time is near at hand when "ironclad" guarantees will not be exacted. It spells failure to guarantee service for the reason that commercials will be grossly abused by the very men who have nothing to lose when service is guaranteed.

As a further evidence of automobile prosperity, prompt collections and easy money must be taken. A close scouting of this phase of the situation in Detroit leads to the conclusion that the automobile commands the respect of capital. This situation is being bettered by the promptness with which makers of automobiles settle for materials and accessories.

At this time of the year there is much building going on in the various automobile plants, and from these building operations much is expected, both in the way of larger outputs, cheapened production as brought about by more suitable facilities, or the reverse of this latter—better production at the same price.

In this building work much may be learned also. Thus, to borrow a single idea from the building contractors, much building is now done on the basis of agreement with the contractor that the latter charge the owner cost plus a fixed profit. In this there is an idea for something new in the selling of automobiles. If any automobile builder would say to the people, "I will establish factory branches in all the larger cities and sell my cars direct to the public at cost plus a fixed profit, naming that profit exactly, whether it be high or low," such a manufacturer, particularly if his product be a low or medium-sized car, would be swamped with business. Further, if this maker threw his books open, as must the contractor doing business on this basis, so that the truth of his assertions, both as to cost and as to profit, could be readily proven or disproved, he would not alone do a temporary business of a volume which would paralyze an industry used to big figures, but could also be sure of a continuance of this immense business year after year.

MAIL AUTOS IN NASHVILLE DISTRICT

NASHVILLE, TENN., Mar. 28—In consequence of very satisfactory experiments Postmaster A. W. Wills has forwarded to Washington recommendations that collection of mails in the suburbs of the city be by automobile service. With his report, proposals from several local auto concerns for the performance of the service were forwarded. Major Wills found that by the use of automobiles for the collection of the rural mails, delivery was advanced twenty-four hours. Under the present system the last collection is made at 3 o'clock in the afternoon.

By the use of one machine the final collection was begun at 5 o'clock in the southern and western suburbs, the machine then returning to the office. A round of the northern section was made and a return to the post office, after which a third trip was made through the eastern section, the entire time consumed being two hours and fifty-six minutes with about 3,000 pieces of mail matter collected.

NEW AUTOMOBILE CLUB FORMED

Automobile owners in Greene County are forming a permanent organization, and will have headquarters at Waynesburg. The objects are, first, road improvement, especially the proper repairing and keeping up of the roads, and, second, the making of a map of Greene and Washington counties and posting signs to direct motorists. The club will be known as the Automobile Club of Greene County, and has elected the following officers: President, R. L. Hoskinson; first vice-president, Charles E. Dittman; second vice-president, T. N. Millikan; secretary, Dr. Earl Miller; treasurer, S. M. Smith. There are about ninety automobile owners in the county, and the club will affiliate with the State organization.

MICHIGAN AUTO TRANSFER COMPANY

The Mason, Dansville & Stockbridge Auto Transfer Company has been incorporated at Lansing, Mich., for the purpose of establishing an auto line to be run on schedule time between the towns named. Communication hitherto has been slow and difficult between these places.

843 HOBOES RESCUED WEBB JAY

Webb Jay, formerly known as one of the leading automobile drivers of the country and who met with a well-nigh fatal accident while racing at Buffalo in 1905, has had a rather unique experience as a result of the smash-up

One day recently a tough-looking specimen of the common or garden variety of hobo approached Mr. Jay, extended his grimy hand and said: "Gee whiz, I never'd a thought I'd a seen you here now, when I pulled you out of that mud-hole up in Buffalo with your legs and arms busted and pretty near scalped."

Several by-standers heard the remark and greeting and were astonished and not a little displeased when Mr. Jay delivered himself as follows: "Here's a half a dollar; beat it. You are number 843." It was explained later by the former driver that he had kept count of his alleged rescuers that day in Buffalo, all of whom required some trifling financial assistance, and up to date the number had been 843.

COLUMBUS CLUB PLANS RACE MEET

COLUMBUS, O., Apr. 4—The contest committee of the Columbus Automobile Club, of which Perin B. Monypeny is chairman, is canvassing the situation as to the advisability of holding a race meet in Columbus during the summer. The tentative dates given the Columbus club by the A. A. A. were unsatisfactory and the matter has been taken up by correspondence and other dates will likely be secured.

Negotiations have bee nopened with noted drivers and ndications are bright for a successful meet. Last year a small profit resulted from the meet and it is believed that the conditions are better this year.

ABSENT TAIL LIGHTS EARN FINES

From four to a dozen arrests are being made daily by the Columbus, Ohio, police department under orders received recently from Director of Safety McCune, ordering that all motor cars operated within the city limits be provided with the necessary lamps. Most of the arrests have been made because of the absence of a tail light. Fines have been imposed in police court.

Coming Events in the Automobiling World

Apr. 23-29.....Bangor, Me., Auditorium, Second Annual Eastern Maine Automobile and Motor Show. J. Henry Graham, Manager, Old Orchard, Me.
June 20-July 6....Detroit, Mich., Industrial Exposition. Detroit Board of Commerce.
Jan. 7-14, 1911....New York City, Madison Square Garden, Eleventh Annual Show, Pleasure Car Division, Association of Licensed Automobile Manufacturers.
Jan. 17-24, 1911...New York City, Madison Square Garden, Eleventh Annual Show, Commercial Division, A. L. A. M.
Feb. 13-25, 1911..Chicago, Coliseum, Tenth Annual National Automobile Show, N. A. A. M.

Races, Hill-Climbs, Etc.

Apr. 30-May 2....Philadelphia Roadability Run to Atlantic City, Quaker City Motor Club.
May 2.....Flag-to-Flag Endurance Contest, Denver, Col., to City of Mexico.
May 5-7.....Atlanta, Ga., Track Races. Atlanta Automobile Association.
May 9-11.....Harrisburg, Pa., Fourth Annual Reliability Contest to Atlantic City and Return.
May 19-21.....Hartford, Conn., All-Connecticut Reliability Contest.
May 21-22.....Bay Ridge, L. I., Club's Endurance Contest Around Long Island, Crescent Athletic Club and Long Island Automobile Club.
May 30.....Bridgeport, Conn., Hill-Climb up Sport Hill; Automobile Club of Bridgeport.
June 4.....Worcester, Mass., Fourth Annual Hill Climb, Dead Horse Hill.
June 11.....Wilkesbarre, Pa., Annual Hill-Climb up Giants' Despair, Wilkesbarre Automobile Club.
June 15.....Cincinnati, Seventh Annual National Reliability Run for Glidden Trophy, through the Southwest.
Oct. 1.....Long Island Motor Parkway, Vanderbilt Cup Race, Wheatley, and Massapequa Sweepstakes.
Oct. 15.....Long Island Motor Parkway, Grand Prize, Automobile Club of America.

Foreign Shows and Races

Apr. 2-24.....Turin, Italy, Automobile Show.
Apr. 27-28.....Brooklands, England, Two-Day Meeting.
May 1-Oct. 1.....Vienna, Austria-Hungary, Automobile and Aviation Exposition.
May 25.....“The American Cup,” Argentina, Sociedad Sportiva Argentina, near Buenos Ayres.
May 28-June 9....St. Petersburg, Russia, Automobile Exhibition.
May 29.....Copa Catalunya, Voiturette Race of the Royal Automobile Club of Spain, near Barcelona.
June 2-8.....Prince Henry (German) Touring Competition.
June 13-18.....Scotland, Scottish Reliability Trials.
June 20.....French Voiturette Race.
June 21.....French Stock-Car Race.
June 22-July 5....Russian Touring Competition, St. Petersburg to Moscow; also Commercial Vehicle Trials.
June 27.....Speed Trials at Kiev, Russia.
July 12-18.....Ostend, Belgium, Automobile Week.
July 20-25.....Boulogne, France, Automobile Week.
Aug. 1-15.....Ardennes, France, Meeting.
Aug. 15-Sept. 15..French Industrial Vehicle Trials.
Aug. 21.....Salon, France, One and Five Kilometer Trials.
Aug. 28.....Mont Ventoux, France, Hill-Climb.

Road Touring Test for Commercial Cars

EFFICIENCY of trucks and traveling capacity of commercial vehicles are likely to be given a real test in the near future, if plans which are now being formed to hold a touring contest for such vehicles develop the way they are expected to.

Over a score of Western manufacturers have expressed themselves as desirous to enter such a contest and W. Irving Fickling, of New York City, has undertaken to conduct the preliminary work. So far, two American makes of commercial automobiles have been pledged to enter the contest if the proper organization takes hold of it and two foreign makers have also agreed to enter. These cars are the Rapid, Reliance, Panhard and Saurer. In addition it is hoped that a dozen other varieties will be attracted, contingent of course upon satisfactory rules, dates and routes.

According to tentative plans already submitted, the contest may extend over a week or a month. Charles E. Stone has formulated the following ideas upon which to base the tour: Each entrant may nominate one or more cars and shall have the privilege to name a technical expert to serve upon the committee who is not in any way affiliated with any competing company.

Vehicles should be required to carry the maximum catalogue load in sand bags supplied by those in charge of tests. The weight of the body should also be considered in the final reckoning. All vehicles should be fitted with some form of recording instrument showing speed, trip and total mileage.

Vehicles, on favorable roads, should be required to maintain the maximum catalogued speed. All vehicles should be fitted with lamps, horns and such tools and spare parts as catalogue calls for, but none other. Each vehicle should be in charge of a driver and if desirable a helper who must do all the work of adjusting and repairing, and, in addition, an experienced unbiased observer to note the performance of all work done upon his truck and to keep a thorough record of same.

At the various stops, which will amount to a "control," the machines may be exhibited to interested people, but no work or adjustment of any kind allowed, all of such must be done upon the road. The running schedule of each car should be rigidly insisted upon and no credit given for reaching "control" ahead of its particular schedule.

All gas and oil tanks as well as radiators should be carefully measured previous to the start of the run, in order that each official observer may be able to keep careful record of all gasoline, oil and water used during the test. The circumference of each tire should be ascertained by means of a steel tape previous to the start of the test, in order that the wear may be determined at the completion of the run.

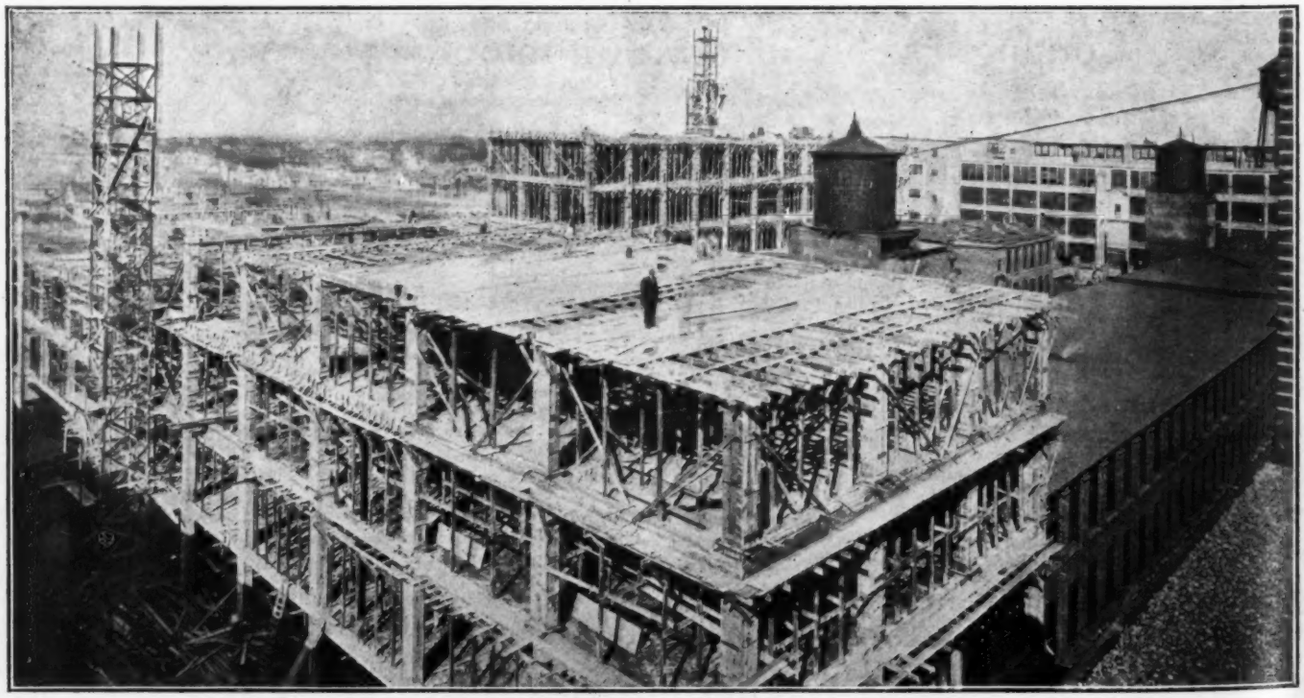
At the completion of the test, the official observers will turn over to those in charge all of their data and awards for reliability and efficiency should be based upon the weight of load carried plus weight of body; gasoline, oil, grease and water used, nature and number of adjustments and replacements made as well as any other trouble together with the mileage and running time. Other regulations may be devised if the situation so indicates.

PLOW FACTORY MAKES ROOM FOR CARS

In order to provide more room for a motor car factory, the Hartford Plow Company, a concern which contributed to the foundation of the Kissel Motor Car Company, of Hartford, Wis., has been sold to the David Bradley Manufacturing Company, of Bradley, Ill. All of the employes of the Hartford Plow works will remain as employes of the Kissel Company.

PLANS FASTER STANLEY STEAMER

WORCESTER, Apr. 7—The Worcester Automobile Club to-day sent out notices to automobile manufacturers and dealers calling attention to the annual hill climb on Dead Horse Hill, Saturday, June 4. Freeland O. Stanley, of Stanley Brothers, builders of steam automobiles, was in Worcester this week relative to plans for a new racing car.



In 1904 the Packard Motor Car Company, of Detroit, moved into a factory with 98,000 square feet of floor space, some two acres, which at the time was the talk of the trade, and the subject of numerous articles on the marvelous growth of the industry. Now the floor space in use and under construction by the Packard Company aggregates 32 3-4 acres, and there are 5,600 employees. The latest addition necessitates tearing down some parts of the original factory, including the power house, but when completed will make the construction uniformly of reinforced concrete.

Jersey Club Lays Out Interesting Route

PARTICULARLY interesting is the 150-mile course laid out for the road contest of the New Jersey Auto and Motor Club of Newark, which will take place in the early part of June. The pathfinding party went over the route last Sunday and their report on their experiences shows that, in any weather, the course selected will test the stamina of any car. While the weather in June is generally fine, the hills found along the way were steep enough to give the cars an adequate try-out, even in the best of weather.

As it was, the pathfinders had a rather exciting time of it on the slippery dirt roads. One-third of the route is over such going, but the remainder of the trip is over good macadam pavement. The run will start from the clubhouse at 6 o'clock and will extend over 15 hours of running time. While this makes a long day's work for the contestants, it is expected to turn out all right. The route selected is as follows:

The course starts at the clubhouse at Newark, goes out Central avenue to Grove street, over to Plainfield avenue, then through Plainfield, Montclair; at the top of the Montclair hill turns to the right and goes through Pompton, and turns to the left at Newfoundland; then over past Green Pond to Rockaway, Dover; through Dover to Budge Lake, and then to Hackettstown, which will be one of the controls; from Hackettstown the course is laid through Washington, New Hampton, Clinton, Glen Gardner, Flemington, White House, Somerville, Dunellen, Plainfield, Scotch Plains, Springfield and back to the clubhouse in Newark.

MANY ENTRIES IN PRINCE HENRY TOUR

BERLIN, Apr. 1—Entries for the Prince Henry Tour number 50 so far and a large additional list of cars will undoubtedly enter before the books close. William Opel, winner last year, has sent in an entry, making nine Opel cars to participate. A like number of Austrian Daimler cars have been entered. Eight Benz machines and eight Mercedes will take part.

The Berlin Motor and Aero Club's show is attracting an immense amount of attention. The Emperor and royal house are exhibitors, as the auxiliary boats, attached to the royal yachts, are being shown. Two airships and a number of fast motor boats are being exhibited.

NEW REPAIR SHOP FOR WINTON PLANT

Work is being pushed on the new building of the Winton plant at Cleveland, which will be occupied exclusively as a repair shop and parts departments when it is finished. It will be 308 by 70 feet, and of steel and brick construction. Several of the present buildings will be relieved by the new structure, and the facilities of the plant will be materially increased.

REPRISALS ON NEW JERSEY TOURISTS

BOSTON, Apr. 9—If a measure now under consideration by the committee on roads and bridges of the Legislature goes through, Massachusetts will be the first State to retaliate upon New Jersey and other States which do not grant the same privileges to Massachusetts motorists as Massachusetts grants to motorists from those States. It is proposed to limit the time a non-resident can drive in Massachusetts to ten days in any one year and to extend this courtesy only to such States and countries as extend similar privileges to residents of Massachusetts.

SENTINEL TOUR ARRANGED FOR JULY

George A. West, chairman of the contest committee of the Wisconsin State Automobile Association, has sent out a circular to owners and dealers in Wisconsin in regard to the first annual tour for the Milwaukee *Sentinel* $1,000 trophy. The contest will be held during July, and will be under A. A. A. sanction.

"The principal objects of the tour," says Mr. West, "will be to stimulate motoring interest and establish a closer affiliation among dealers and owners throughout the State.

Additional floor space in their factory, to the amount of 70,000 square feet, will be gained by the erection of another big building by Wheeler & Schebler, makers of the Schebler carbureter, at Indianapolis. The building is now in course of construction. It will be three stories, of reinforced concrete and will give facilities for 200 more employees, raising the total product of the company to 1,000 carbureters a day. The company has now installed gas engines developing 350 horsepower.

Elgin Has a Natural Race Course to Consider

CHICAGO, Apr. 18—A stock chassis road race run by the Chicago Motor Club is one of the possibilities of the present season, the first step in that direction being taken last Friday night when a committee from the club attended a meeting called by the citizens of Elgin, Illinois, for the purpose of considering the proposition. Elgin has a natural course which was discovered by Frank Wood, manager of the Chicago Knox branch and a recent inspection of it by the motor club brought about a desire on the part of its officers to use it for racing purposes. Elgin citizens spoken to in regard to the matter were favorably impressed and the meeting was the result.

Big enterprises like this are not put through in a day or even a week, and therefore the meeting did not make any decision in the matter. The Elgin citizens listened to the talk of the motorists as to the advantages the town would derive through having such a big event run at its very doors, seemed impressed with the idea and wound up by appointing a committee consisting of M. M. Cloudman a leading coal dealer of the town; W. W. Willson, publisher of an Elgin paper; and Fred W. Jenks, manager of the opera house. This committee has undertaken to canvass the situation thoroughly and secure from the business men of Elgin a guarantee fund of $15,000 with which to promote the race. This committee has promised to report by May 1 and from the talk of the evening it was believed that the report will be a favorable one.

According to the plans outlined at the meeting, the Chicago Motor Club favors holding the race the latter part of August or the first part of September, possibly asking the contest board of the American Automobile Association to make it a national stock chassis event now that Lowell, Mass., has decided it will not promote that classic this year. It is figured that the expense of putting on such a race would not be great because of the natural advantages offered by Elgin, which is only 38 miles from Chicago and with excellent transportation both by electric trolley and by railroad. The course itself is at the end of Highland avenue and exactly one mile from the business center of the town. A trolley runs to within 100 feet of the course, while at the northwest corner of it is the McQueen railroad station. The course itself is gravel the entire distance, and the exact distance around is 8.4 miles. At the present time the road is in need of scraping, which would not involve a very great expenditure of money. Scraped and oiled, it would be as fast a circuit as Riverhead, Long Island, it is believed, and it ought not to cost much more than $8,500 to put it into racing condition.

It is almost certain that the Chicago Automobile Club will not promote a road race this year, which would leave an excellent opening for the Chicago Motor Club which already has planned a strenuous campaign for 1910, including an economy run on April 28; a demountable rim test, in May; the annual hill-climb at Algonquin in August; and the 1,000-mile reliability in October.

TESTING TAXIMETERS FOR ACCURACY

WASHINGTON, D. C., Apr. 18.—Col. W. C. Haskell, Sealer of Weights and Measures, is the greatest friend the taxicab rider ever had. The picture portrays the Colonel in his original act entitled "Testing a Taximeter." The device by which the Colonel makes the test is an invention of his own, and is probably the only machine of the kind. By attaching the flexible wire of the taximeter to the large wheel the Colonel can find out in one hundred turns of the big wheel whether or not the taximeter is cheating the rider or the chauffeur. One hundred turns of the wheel represent a quarter mile riding by taxicab. Every taxicab in the District has to carry a tested taximeter, and every one of them is tested on Col. Haskell's home-made taximeter tester

Col. Haskell and His Taximeter Testing Device at Work

DEATH CLAIMS AUTOMOBILE MAKER

Thomas M. McLean, president of the Embree-McLean Carriage Company, of St. Louis, died at his home April 9 after an illness extending over several months. He was born at Hollidaysburg, Pa., in 1846 and removed to St. Louis after the great fire in Chicago in 1871 which destroyed the plant of the concern for which he was working. He engaged in the hardware business until about twenty years ago when with James G. Embree he founded the present company. Recently an automobile department was added to the concern and Mr. McLean devoted his most enthusiastic efforts to it.

ELECTRICS ON SHOW AT NASHVILLE

NASHVILLE, Apr. 17—An event of interest to the Nashville public and autoists in particular is the exhibition of the Rauch & Lang Electric Automobile Company of many kinds of handsome cars manufactured by that company. The show was held Thursday, Friday and Saturday of last week. The local agent of the company is A. R. Whiteman. Runabouts, stanhopes, victorias and coupes were on exhibition and demonstrations were given of the "Exide" battery and the mercury arc rectifier, upon the charging of cars.

FIVE ENTRIES FOR GLIDDEN TOUR

Entries for the Glidden Tour have been made by the Premier Motor Manufacturing Company for two cars, which will be numbered 1 and 2. The Moline Automobile Company have entered three cars for the Chicago trophy and they have been given numbers 101, 102 and 103. At least fifty cars are expected to enter.

A. C. A. FINANCES GARAGE PROJECT

Justice Blanchard of the New York Supreme Court granted permission to the Automobile Club of America to mortgage its Fifty-fifth street property for $400,000. Quarter of this will be used to retire a previous mortgage and the rest will be utilized in the building of a luxurious clubhouse and garage.

Endurance Tour To Scranton Will Be Arduous

NORRISTOWN, PA., Apr. 11—A score of local clubmen and Philadelphia newspaper men spent three days last week in spying out the land for the coming third annual endurance run of the Norristown Automobile Club, May 18-19. The six carfuls of pioneers successfully "pathfound" the 327-mile route to Scranton and return, and reported the trip one of the finest in point of scenic attractions and one of the most strenuous as regards physical difficulties ever planned for the club's annual fixture.

The cars which carried the exploring party were an American, an E-M-F, an Otto, a Selden, a Knox and a Premier.

All the preliminaries in the way of securing garage accommodations at the overnight stop and the establishment of intermediate checking stations were attended to, and the running schedule adopted will be close to the 24-mile-an hour maximum allowed by the State law. The itinerary for the two days is as follows:

First Day

	Miles
Norristown (Hotel Montgomery) to Reading (Mansion House)	37.4
To Pottsville (Allen House)	35.6
To Hazleton (Central Hotel)	33.2
To Wilkesbarre (Hotel Sterling)	26.6
To Scranton (Hotel Jermyn)	18.6
	151.4

Second Day

	Miles
To Stroudsburg (Hotel Fulmer)	46.2
To Easton (Hotel Karldon)	27.2
To Allentown (Allen House)	27.3
To Philadelphia (Auto Trade Assn.)	52.4
To Norristown (Hotel Montgomery)	22.5
	175.6

There will be a large proportion of low-gear mountain work from Pottsville to Wilkesbarre on the first day, and from Scranton to Stroudsburg on the second, but the magnificent Pocono scenery and the beautiful Delaware Water Gap section will doubtless be much enjoyed by the travelers.

TIMERS AND SCORERS FORM CLUB

Expert timers and scores of Philadelphia, to the number of twenty-two met last week at the rooms of the Quaker City Motor Club and formed an organization known as the Timers and Scorers Club of Philadelphia. Much difficulty has been experienced in the past in Philadelphia and in fact nearly everywhere on account of amateur work in timing and scoring road and track events, and it is the avowed purpose of the newly formed club to obviate difficulties of that kind.

Prior to the running of such an event as the Fairmount Park Road Race, the club will meet and go over the situation with care, arranging the details so that all contingencies may be met.

They will install automatic electric timing devices and in the Fairmount race they are preparing a score board of an improved type. For the club's roadability tour April 30 to Atlantic City synchronized clocks at Philadelphia and Atlantic City will settle any possible disputes as to running time. E. S. Nyce has been named chairman of the timing committee.

The officers of the club are as follows: Paul B. Huyette, president; George E. Potts, vice-president; A. Paul Oliver, treasurer; I. C. Minford, secretary; Thomas F. Meehan, assistant timer; W. C. Jackson, chief scorer; S. W. Waddington and L. W. Williams, assistant scorers.

ALL-CONNECTICUT RELIABILITY CONTEST

Definite announcement of the details of the All-Connecticut Reliability Contest has been made. The run will start May 19 and will extend over three days, covering about 600 miles. The affair will be conducted by the Contest Committee of the Automobile Club of Hartford, assisted by the automobile clubs of Bridgeport, New Haven, Litchfield County, Willimantic and New Britain.

PREPARE FOR ORPHAN'S DAY

Thursday, June 2, will be Orphans' Automobile Day in New York City. The place as usual, for the day's outing, will be Coney Island, although the exact amusement resort has not as yet been selected. This was decided upon at a well-attended meeting of the Orphans' automobile day committee of N. Y. Col. K. C. Pardee presided, with Alex. Schwalbach as secretary.

MAC MANUS-KELLEY MOVES TO DETROIT

In order to be close to the seat of greatest activity, the Mac-Manus-Kelley Company has removed to Detroit. This big concern, which has a large and important clientele, is now located in the Ford Building, in the Michigan metropolis.

OWEN ON BOARD OF REO COMPANY

Raymond M. Owen, head of R. M. Owen & Company, general sales agents of the Reo Motor Car Company, has been elected vice-president and director of the latter company, having purchased the interest of R. Shettler, retiring vice-president.

In 1901, Mr. Owen was instrumental in placing the largest order on record up to that time for automobiles when he and his partner ordered 1,000 Reo cars for their New York territory. Three years later he arranged to market the entire product of the Reo company and since that time, largely as a result of his business foresight, over 30,000 Reo cars have been sold.

WINNERS IN SAVANNAH ROAD RACE

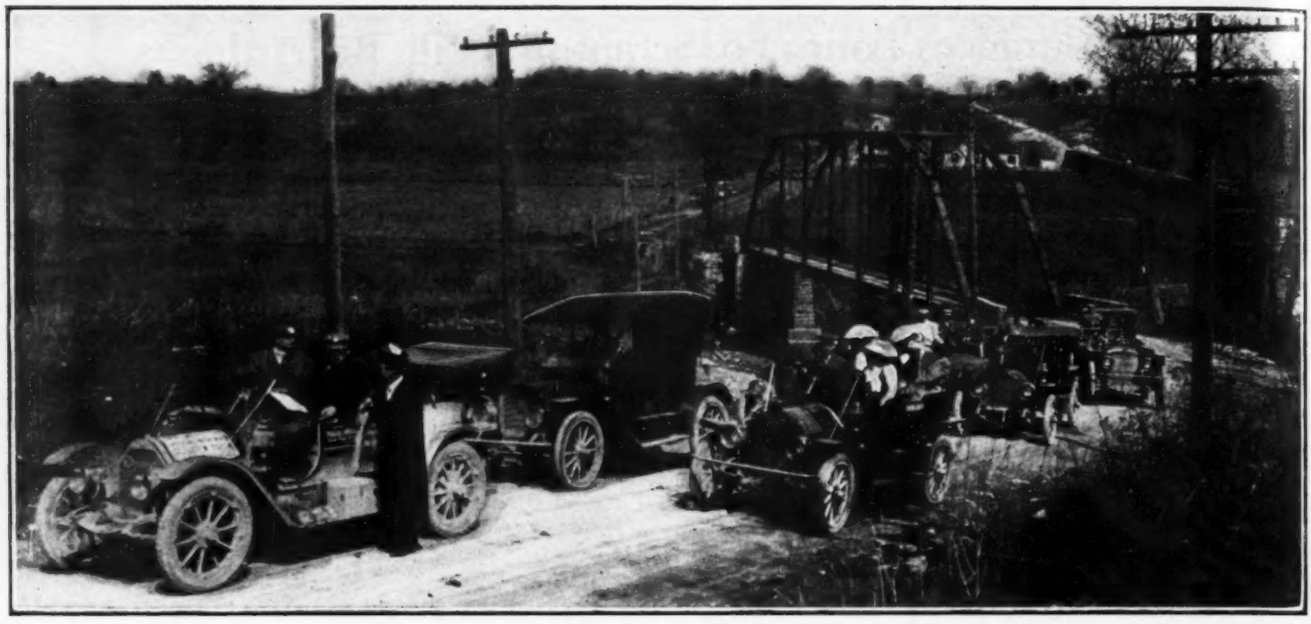
SAVANNAH, GA., Apr. 18—Winning cars in the three classes that competed in the recent Savannah-Jacksonville road tour were as follows:

Class A—Stevens-Duryea, 24-horsepower, driven by A. Solomon; perfect score. Class B—Cole, 30-horsepower, driven by R. S. Brown; perfect score. Class C—Maxwell, 12-horsepower, driven by Mrs. L. W. Hazard, and Hupmobile, driven by Chris Jacobs. They were tied with a perfect score.

BUICK WINS MATCH HILL CLIMB

W. J. Stoddard, of Atlanta, was obliged to act as host at a dinner party held at the Hotel Piedmont of that city as the result of a hill-climbing contest in which his car, a National 40, met defeat in the match event on Stewart avenue. A Buick 16 proved the winner. William Oldknow was the driver of the victor, as well as guest of honor at the dinner.

William Oldknow in Buick, Winner of Match Hill Climb at Atlanta



County Bridge Between Middletown and Shelbyville, Ky., Where Louisville Enthusiasts Met the Glidden Pathfinder

Glidden Pathfinder Has Varied Experiences

EVERY variety of automobile experience was enjoyed during the first week of the 1910 Glidden Tour, pathfinding expedition. All kinds of weather conditions have prevailed, except sandstorms and blizzards, but aside from delays, caused by washouts and swollen streams, satisfactory progress has been made.

Scout Lewis and his party have had a rather strenuous time in spots, but, as a whole, the trip has been enjoyable so far.

From Cincinnati to Lexington the roads are fine, having a limestone foundation and kept in excellent repair. From Lexington to Louisville the same delightful road conditions prevail, or at least they will prevail when the tour proper commences. A series of terrific rainstorms has swept the valley recently and, as a result, little streams boom along with a picturesque savagery that will undoubtedly be tamed by the middle of June.

The run to Nashville was generally pleasant, but in spots the pathfinders had to lend a shoulder or do some wading. A big welcome was given the car at Nashville. This city prides itself upon its progressive spirit, prosperous commerce and pretty girls, and the reception was particularly warm and hospitable. Nashville will be a night control of the tour and the advent of the pathfinders had the effect of arousing such a furor of automobile enthusiasm, that it is quite likely that before the tourists arrive there will be a full-fledged automobile club to act as hosts.

E. L. Ferguson, tour manager, and Mr. Lewis, scout, were called upon for advice as to the formation of the club. They recommend a democratic body with a low entrance fee and a wide scope of activity. The city has over 800 automobiles in use.

From Nashville the car crossed into Alabama where swollen streams and deep roads resulted in considerable hard work and more delay.

The weather began to clear and the going proved easier just before the close of the first week, but the Alabama rivulets effectually prevented anything like good time. Across the Mississippi River, the Arkansas roads are reported swampy and the trip across that State and on to Dallas will doubtless consume more time than was anticipated in making the preliminary schedule.

WILDWOOD CLUB LAYS PLANS FOR RUNS

PHILADELPHIA, Apr. 11—At a meeting last Wednesday night, the plans of the North Wildwood Automobile Club for the coming season were officially decided upon. They include the usual July 4 meet on the Wildwood Speedway, preceded by a club run from this city; a similar meet on July 30; a motorcycle meet on August 6, and the Labor Day wind-up on September 5, when an effort will be made to have all the national cracks on hand for a series of short-distance events on the Speedway.

The club's $12,000 club house, located on the Speedway, has been refitted, and the membership, now numbering 104, will, it is believed, be increased to upwards of 200, before Independence Day.

Arrangements were made for the entertainment of the contestants in the endurance run of the Motor Club of Harrisburg, who are scheduled to spend the night of May 10 at Wildwood.

A score of ladies, who compose the Ladies' Auxiliary were present at the meeting and the supper which followed.

ELKHART'S PLEA FOR GOOD ROADS

ELKHART, IND., Apr. 18—Co-operation of farmers and residents in the bettering of conditions of country roads is asked by the Industrial Association of this city. In an endeavor to prove to every resident of the northern part of the county the benefit to be derived from good roads, the association will shortly send out pamphlets to 10,000 persons giving statistics and facts to prove the need of such improvements. The book is entitled "Elkhart's Plea for Good Roads."

GARAGE OWNERS FORM ORGANIZATION

Garage owners of New York formed a preliminary organization Tuesday for the purpose of effecting a number of general reforms in that line of industry. The meeting was held at Reisenweber's and was attended by over a score of leading members of the business. The objects, as stated at the meeting, are to eliminate the criminal element among chauffeurs; to provide for concerted action and to foster the best automobile interests.

Durant and Morgan Deny Merger Reports

REPORTS circulated rather vigorously during the past week to the effect that J. P. Morgan & Company were preparing to merge several large automobile interests, have been met with sharp denials. The chief of these rumors was that the United States Motor Company and the General Motors Company, with all their ramifications, were to be amalgamated. J. P. Morgan, Jr., entered a positive denial of the alleged merger as far as the great banking house is concerned, and W. C. Durant of the General Motors Company was equally forceful in stating the position of his company.

"So far as they refer to General Motors," said Mr. Durant in speaking of the reports, "there is not a word of truth in them."

"The General Motors Company is not interested in any merger, pending or prospective, and I wish to state that the published and reiterated reports that J. P. Morgan & Company had any part in the formation of the General Motors Company is without semblance of truth. I might add that J. P. Morgan & Company have no interest in General Motors at present as far as I know.

"For over a year," continued Mr. Durant, "this company has carefully refrained from denying fanciful and baseless stories published about its antecedents and activities. Such denials would congest news space in many publications and if we had attempted to make them, the work involved would have proved burdensome. Another viewpoint from which this situation might be examined is that the public is likely to look upon denials of news and alleged news as a variety of undignified publicity.

"The company wishes to avoid giving ground for such an impression, which ought to be sufficient reason for our silence during a long period of misrepresentation. The company is not for sale."

A. L. A. M. SUING AND ALSO SUED

Litigation of the cross-fire order, based upon the Selden patents has been started for and against the Association of Licensed Automobile Manufacturers. The association recently filed seven suits at Detroit, naming as many unlicensed makers as defendants. These companies are: Owen, Abbott, Demot, Warren-Detroit, Paige-Detroit, Velie and Parry motor car companies.

Wednesday advices from Milwaukee tell of the filing of a suit for $500,000 damages by the Velie Motor Company of Moline, Ill., against the A. L. A. M. In the complaint it is alleged that the efforts to enforce the Selden patents works as a restraint of trade, within the purview of the anti-trust act.

MAKING PROGRESS IN SELDEN CASE

Judge Hough of the United States Circuit Court on Monday heard arguments with regard to a supplementary bill filed by the complainants in the suit of The Electric Vehicle Company and Selden against the Ford Motor Company, Panhard et al., to substitute the Columbia Motor Car Company for the Electric Vehicle Company, as party complainants. This action would have been unnecessary if the proceedings under the original suit had been followed out, but at the last moment the Ford company declined to accede to the substitution and the supplemental bill was resorted to.

The court allowed the attorneys until Wednesday to submit briefs covering the law points involved.

Los Angeles Meet Proves Success

ONE of the most spectacular race meetings ever given in this country was concluded when the motordrome meet at Los Angeles was finished last Sunday. The races demonstrated that the track is fast and comparatively safe and records fell like tenpins before the rush of the flying motors. Many of the contests were won by narrow margins and accidents were remarkably few.

The summaries:

April 13—First heat, ten-mile, free-for-all, Darracq (Kerscher) first, Fiat (De Palma) second. Time, 7:01.

Five-mile, free-for-all handicap, Stoddard-Dayton (Livingstone), 12 seconds, first; Marmon (Harroun), 10 seconds, second; Isotta (Marquis), 11 seconds, third. Time, 3:50.55.

Fifty-mile free-for-all, Fiat (De Palma) first, Stoddard-Dayton (Livingstone) second, Marmon (Harroun) third. Time, 37:55.53.

April 15—Ten-mile, stock chassis, 161-230 cubic inches, Buick (Nikrent) first, Cole (Endicott) second, Firestone (Miller) third. Time, 8:40.17.

Ten-mile, free-for-all, Fiat (De Palma) first, Fiat 90 (Bragg) second. Time, 7:11.62.

Ten-mile, free-for-all, stock chassis, 600 cubic inches, Fiat, (De Palma) first, Knox (Oldfield) second, Marmon (Harroun) third. Time, 7:38.23.

Ten-mile stock chassis, 451-600 cubic inches, Knox (Oldfield) first, Fiat (De Palma) second. Time, 7:22.92.

Fifty-mile, stock chassis, 390-450 cubic inches, Marmon (Harroun) first, Marmon (Wade) second. Time, 39:53.55.

April 16—Five-mile, stock chassis, 301-450 cubic inches, Buick (Nikrent) first, Marmon (Harroun) second, Marmon (Wade) third. Time, 3:56.68.

Ten-mile, stock chassis, 451-600 cubic inches, Knox (Oldfield) first, Stoddard-Dayton (Livingstone) second. Time, 7:20.66.

Two-mile match race between Fiat (Bragg) and Benz (Oldfield), won by Fiat. Time, 1:28.73.

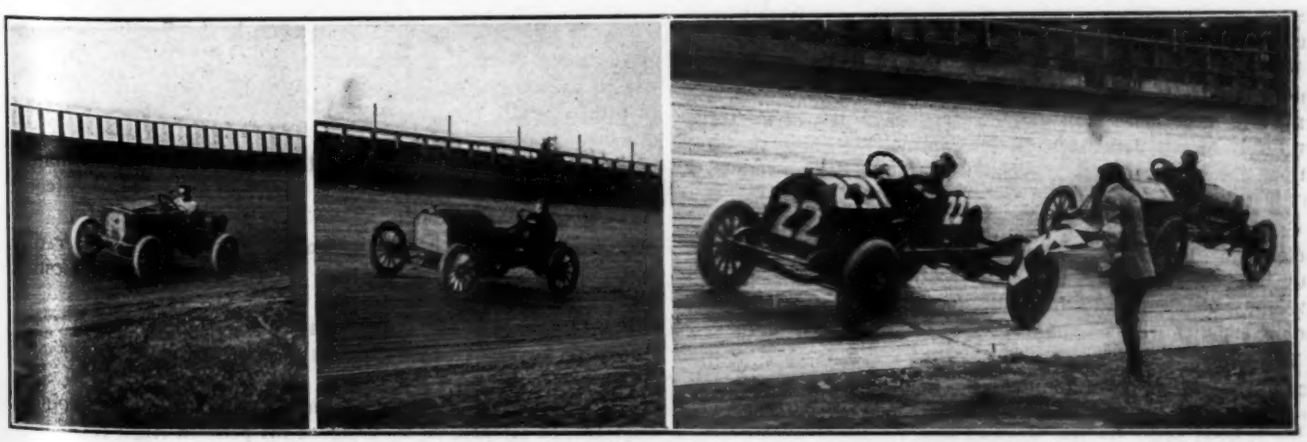
April 17—Ten-mile, 161-230, Cole (Endicott) first, Warren-Detroit (Miller) second, Buick (Nikrent) third. Time, 8:46.74.

Three-mile, stock chassis, Three Fords, driven by Pratt, Stearns and Olsen, finished in order. Time, 4:62.

Ten-mile, 301-450, Buick (Nikrent) first, Marmon (Harroun) second, Marmon (Wade) third. Time, 7:36.61.

Two-mile, second heat of match race, Fiat (Bragg) first, Benz (Oldfield) second. Time, 1:19.48.

One-hundred mile, stock chassis, under 600, Marmon (Harroun) first, Buick (Nikrent) second, Knox (Oldfield) third. Time, 1:16:21.80.



Kerscher in Darracq, Robertson in Simplex, and Endicott in Cole Winning Ten Mile Stock Chassis Race at Los Angeles

Among the Garages

Fleet of White Taxicabs owned and operated in Boston by Saunders & Butler. This form of conveyance has become deservedly popular in the Hub

Frank G. Van Dyke, president of the Van Dyke Motor Car Company

Ground has been broken at Newport, R. I., for the most elaborate private garage in America for Mr. and Mrs. Edward J. Berwind, close to their estate on Bellevue avenue, and it will cost about $150,000. Of limestone and fireproof material, the building will measure 125 by 70 feet. It will be two stories high and will have sunken wells for gasoline. The main part of the building, with its wings, will have in the center an immense ring, where Mr. and Mrs. Berwind or their guests can try out new machines. The garage will be roomy enough for storing eight machines.

John Conway, T. W. Orbison and others on Washington street, Appleton, Wis., have become associated for the purpose of building a large fireproof garage at a cost of $25,000. The garage will be leased by Harry Griffin and Chester Scott, who have been operating a garage in connection with the agency for the Kissel, Buick and Cameron, in the former Ullman livery stable. The garage will be 50 by 125 feet, one story high, of solid brick and concrete. Fire walls will separate the garage from the repair shop at the rear, making it possible to do repair work at night by artificial light, without danger.

The Penn Auto Supply Company which recently opened a branch at 1407 Filbert street, Philadelphia, opposite the City Hall and Broad Street Station, has inaugurated an innovation by making the branch an "open-at-night" establishment, and the first week of the experiment has proved so successful that President John W. Lee contemplates making it a permanent feature. The same idea will be followed out at the company's Atlantic City branch during the Summer season.

The Van Da Grift Auto Car Company will open its new garage in Louisville about May 15. The plant will be fireproof, steam heated and modern in every respect. Both gasoline and electric cars will be handled and a complete machine shop in connection will furnish the means of reconstructing cars from wheelbase to canopy.

Howard G. Robinson, for several years garage manager for the Rauch & Lang Company, and A. J. Mills, who has had ten years' experience with gasoline cars, have opened a garage on Emily street, Cleveland. Before formally opening the new garage the two men had practically contracted for enough cars to fill it.

G. H. Luck & Company, Keene Valley, N. Y., have just completed their new fireproof garage on Market street. It is up to date in every respect. A first-class repair man will be kept, and any job outside a factory can be done. A full line of automobile supplies will be kept.

The Bound Brook Garage, Bates-Wilder Company, at North Scituate, Mass., is making an addition of about 1,500 square feet to the fireproof garage and is building a new office. The company is local agent for the Maxwell line.

Gadsden, Ala., is rejoicing over the starting of work on the garage of the K.-E. Auto & Electric Company on Broad street, between Fifth and Sixth. The building will be 50 by 100 feet, one story in height and fireproof, designed especially with view to occupancy as a garage.

The Toledo Garage & Supply Company, of Toledo, Ohio, was incorporated with a capital of $5,000 by George T. Browning, F. M. Bushong, E. E. Sheppard, Charles A. Langdon and Alvin C. Jones.

The Portage Motor Car Company, of Akron, Ohio, was incorporated with a capital stock of $5,000 by Louis P. Dettling, Emma C. Dettling, Albert Buehrle, B. Buehrle and Albert J. Engle.

The Howard-Cregor Company, of Nashville, will move into its new garage within the next week. The location is ideal, on Broadway, and the building is well adapted for its purpose.

The Rhinelander Iron Company, of Rhinelander, Wis., has started construction work on a new repair shop, 30 by 50 feet. The new building will have ample garage facilities.

Charles D. Fenn, of Antigo, Wis., has started the erection of a garage of solid brick, 26 by 75 feet in dimensions.

Brief Personal Trade Mention

H. A. Brown, Jr., formerly on the staff of the Hyatt Roller Bearing Company, has accepted an offer from the Holcomb Steel Company of Syracuse, N. Y. Mr. Brown's headquarters will be in the New York branch of the concern which makes a full line of automobile steel.

Harvey H. Colbath, manager of the Philadelphia Morgan & Wright branch, was married last Wednesday in the Protestant Episcopal Church of the Annunciation, to Helen V. Cadwalader. They are now enjoying their honeymoon in the South.

Alexander Winton, accompanied by Mrs. Winton, sailed for a trip to Europe on the *Mauretania*, April 13. After a short visit in Scotland, Mr. Winton expects to take delivery of his Antoinette monoplane at Paris.

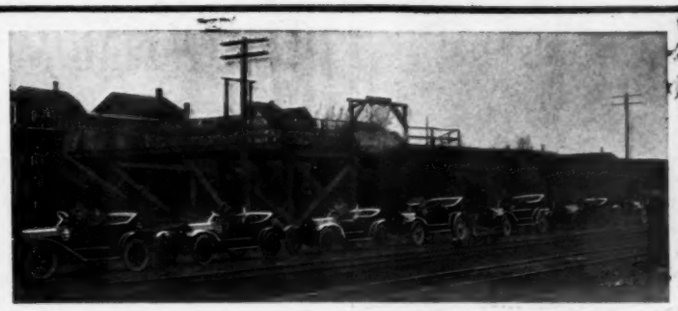
George A. Horner was promoted to the post of general manager of the Rapid Motor Vehicle Company, of Pontiac, Mich., April 1, vice Harry Hamilton, who died recently.

C. Booth Tomlins, of Chicago, has been appointed manager of the motor car department of the W. H. Hobbs Supply Company, of Eau Claire, Wis.

F. A. Flint, assistant sales manager of the Moon Motor Car Company, was married on April 14 to Miss Nellie Allie Harper, of St. Louis.

H. J. Newman, designer of the Coates-Goshen Automobile Company, of Goshen, N. Y., resigned his position April 1.

With the Agencies



Group of finished Kisselkars, which were formed in line and driven from the factory at Hartford, Wis., to Chicago on account of shortage of freight cars there

S. H. Mora, president and general manager, Mora Motor Car Company

By a decision rendered by Attorney-General Denman of Ohio, it is held that all dealers in motor cars must take out licenses as such. The term agent means one who either handles automobiles for himself or for someone else. The licenses that are to be given agents are the same as those given manufacturers of automobiles.

A branch of the Franklin Automobile Company has been formed at Baltimore with Edward W. Orr as manager. The company has established headquarters at Maryland and Mount Royal avenues. The Franklin car was formerly in the hands of the Mar-Del Company, now exclusive agent for the Packard cars.

J. T. Sweeney, until recently purchasing agent for the Times Square Automobile Company of New York and Philadelphia, has organized the Sweeney Automobile Company and opened salesrooms and offices at 208 North Broad street, where he will deal in high-grade used cars exclusively.

F. C. Reamer, Jr., and Carroll A. Haines, with headquarters at the Park Garage, 2214 Spring Garden street, have been awarded the Philadelphia agency for the Baker electric, which was handled in the Quaker City some years ago by the Foss-Hughes Motor Car Company.

E. R. Jackson, who formerly managed the White branch in Baltimore, and later connected with the Studebaker branch in Philadelphia, has transferred his allegiance to the Longstreth Motor Car Company, Philadelphia agents for the Pullman and Alco.

The Hokanson Automobile Company, of Madison, Wis., has established a branch at Monroe, Wis. Temple Robson, of Benton, Wis., and William G. Breessee, formerly associated with the Holloway Auto Company, of Monroe, are managers.

Frank Lawell, manager of the Franklin Motor Car Company, of Columbus, has taken the Central Ohio agency for the Inter-State. The agency will be handled from the office of the Franklin Motor Car Company, North Fourth street.

A partnership consisting of E. E. Minick, H. S. Pitz and Dr. Sniveley has been formed to take over the Central Ohio agency for the Cole "30," which has been handled by John T. Gill. The agency covers six counties in Central Ohio.

Ralph P. Dowse and L. H. Christian, of Detroit, have taken over the agency of the Car Makers' Selling Company in the Southwest, and will handle the Anhut, De Tamble and Cutting cars from Kansas City headquarters.

August Huerth, of Madison, Wis., and John Knipschield, of Merrimac, Wis., have opened a garage and repair shop in the Gaukel Building at Sauk City, Wis. They will represent the Oldsmobile and Buick.

F. S. Hyatt, purchasing agent of the Columbia Motor Car Company at Hartford, and its predecessor in business, the Electric Vehicle Company, has resigned and has been succeeded by Lyman Smith, of that city.

Fred. E. Devlin, formerly connected with the Pierce-Arrow agencies in Baltimore and Philadelphia, has been appointed manager of the Hills Motor Car Company, Philadelphia agents for the Royal Tourist.

Dr. Wadsworth Warren, Detroit physician, has joined the forces of the General Motors Company, and will have charge of the racing team which will be put out by the Buick Company this Summer.

Benjamin O. Willebrands, until recently general manager of the Willebrands Machinery Company, is now associated with John P. Schneider, veteran automobile dealer, in Detroit.

The Ford Motor Company has leased a large four-story brick building at 5929-5931 Baum street, East End, for five years and will remodel it for its permanent city headquarters.

On page 533 of THE AUTOMOBILE, published March 17, the picture of a fire department automobile which is credited to Taunton, Mass., should be credited to Tampa, Fla.

The Burton-Littlewood Company, 112-114 East Wilson street, Madison, Wis., has been made sales agent for the Studebaker line in a large territory of Western Wisconsin.

D. Thomas Kennan has been appointed manager of the branch of the Swinehart Tire and Rubber Company just established in Philadelphia, at 1437 Vine street.

The agency of the Mea Company, high-tension magnetos and the S. R. O. ball-bearings, has removed to larger quarters at 1777 Broadway, New York.

H. L. Hoppe, former agent of the Hupmobile, has taken the Hartford agency for the Warren Detroit, another of the Western newcomers in that section.

R. D. Rockstead, 323 East Wilson street, Madison, Wis., has been appointed southern Wisconsin representative of the Warren-Detroit.

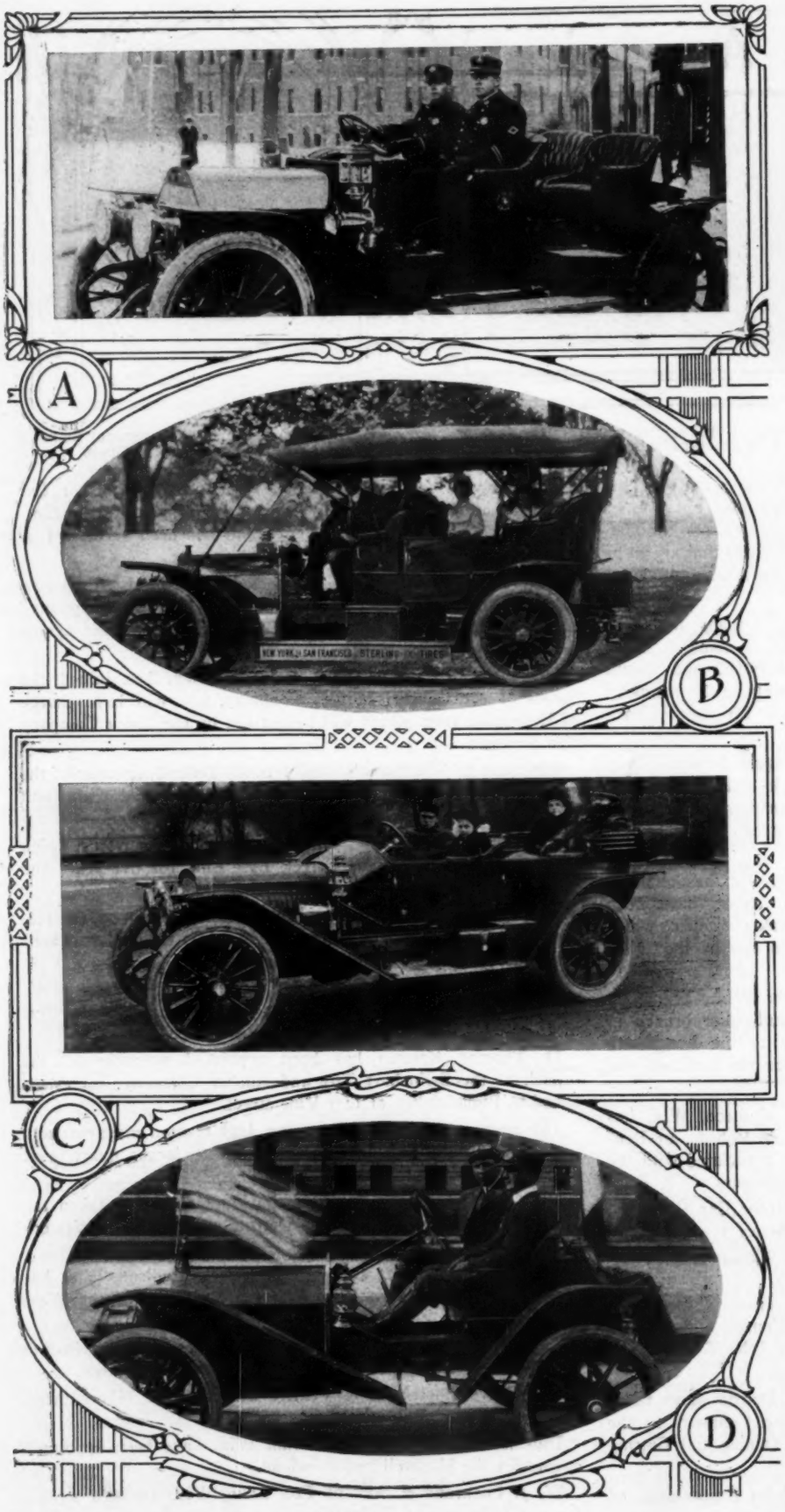
The Swinehart Tire & Rubber Company has opened a Boston branch at 727 Boylston street. A. J. Greene is in charge.

The Deere Implement & Vehicle Company, of Montgomery, Ala., will handle the Jackson this year.

Dinsmore & Calkins, of Delavan, Wis., have been appointed agents for the Maxwell and Overland.

W. J. Cochrane & Son, of Fox Lake, Wis., are new agents for the Jackson and Fuller lines.

E. E. Houk, of Nashville, Tenn., will handle the Jackson line of automobiles the coming year.



A—Alco Car in Fire Department Service at Schenectady, N. Y.
B—Palmer-Singer Car in Which Lewis J. Lampke Made Trip to Coast
C—Lozier Lakeland Model Used by Joseph M. Gilbert of Tire Fame
D—Hupmobile Which Will Prove Strenuous Ability in Flag to Flag Race

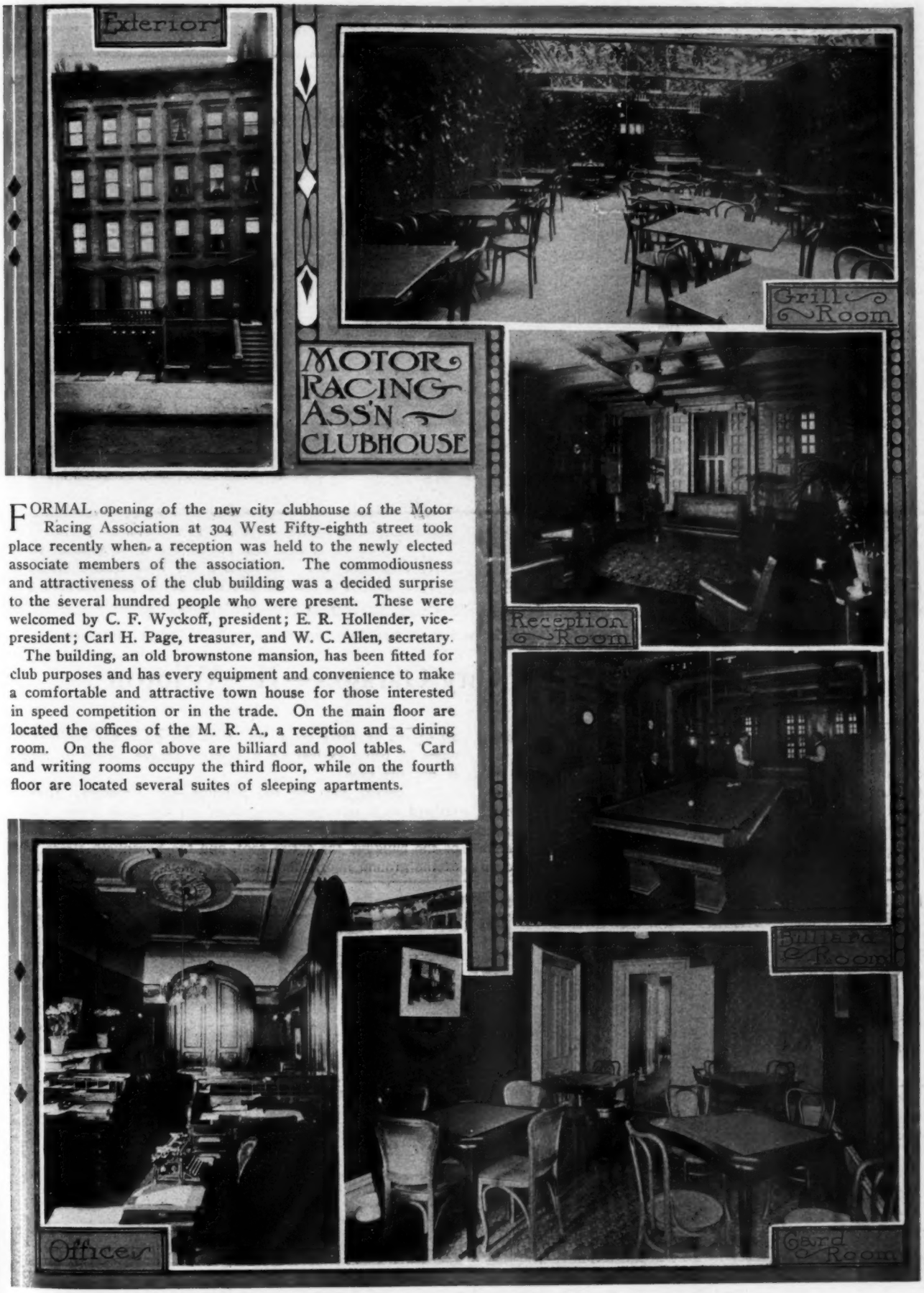
Making a Demonstration

(A) In view of the well developed inertia of the average municipality, those who have occasion to note the progress which is being made in the adaptation of automobiles for fire department service are much inclined to the opinion that it will be but a matter of a year or so when the chief and the field officers of every department of any moment in the country will respond to alarms with the speed which comes from using automobiles. As an example of this character of activity, this illustration presents a 40 horsepower Alco operated by Chief Engineer Henry R. Yates, of the Schenectady, N. Y., Fire Department.

(B) The time has now arrived when family tours extend across the continent, not infrequently, and it is in these long jaunts that evidences of mechanical refinement of automobiles drop out. Obviously it would be an enormous undertaking, fraught with much hardship, were tours of great length undertaken, unless the automobiles used could be implicitly relied upon. Lewis J. Lampke, wife and family, in a Palmer-Singer 40 combines business with pleasure in a trip which he is making from the Atlantic to the Pacific, in which he has scheduled calls upon his customers.

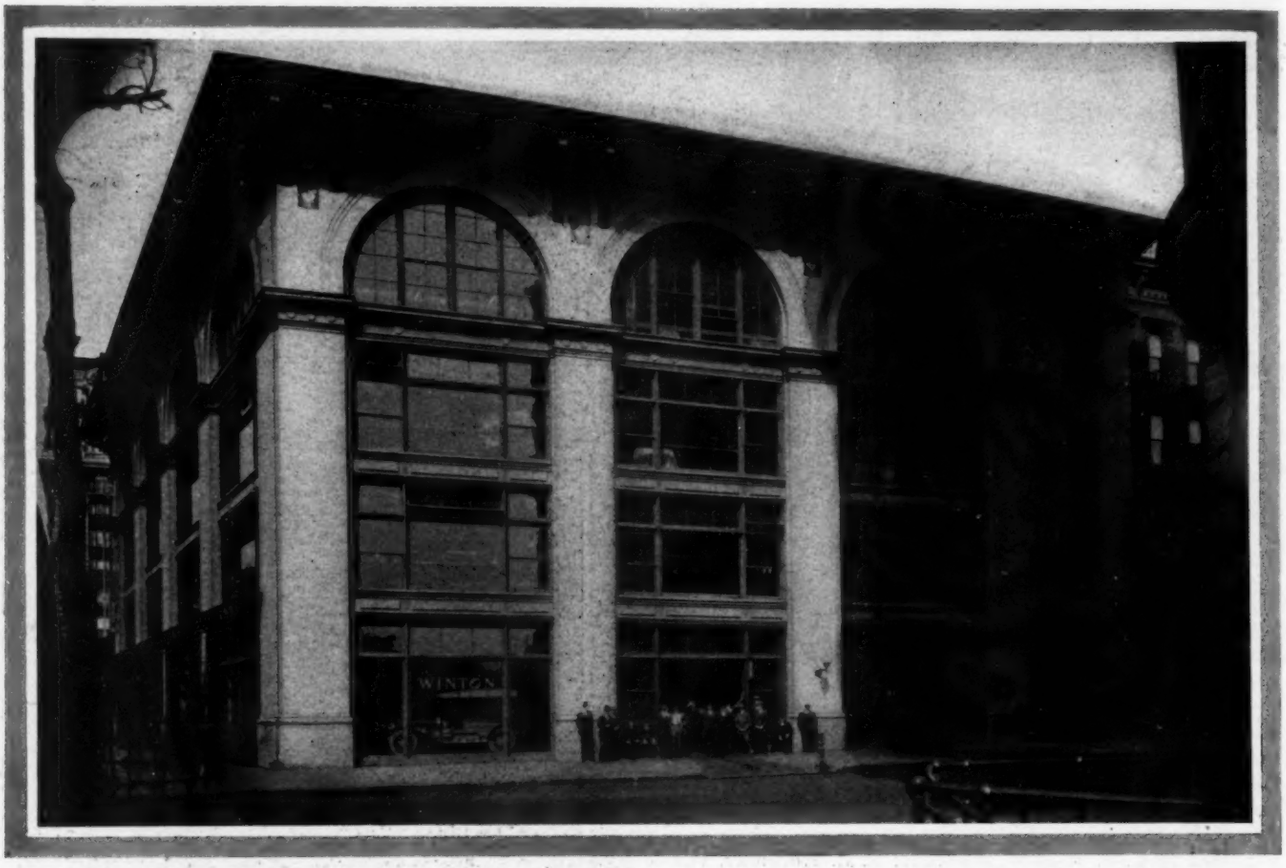
(C) That the gun-boat type of body offers unusual opportunity for touring under pleasurable conditions seems to be a fairly established fact, and Joseph M. Gilbert, manager of the Continental Caoutchouc Company, after a most pleasant experience in a Lozier Lakewood model, is an enthusiastic advocate, claiming that it lends itself either to rapid work or loafing.

(D) The Flag to Flag Contest offers wide opportunity for the strenuous testing of automobiles, and E. W. Swanbrough, of Denver, has entered a Hupmobile, with a view to showing how well this make of car will travel from Denver to Mexico City. The distance strings out on the tape for long, but this is not the important matter; the car will have to negotiate 1,000 miles of sand-strewn flats, some scores of troublesome rivers, and a desert or two.



FORMAL opening of the new city clubhouse of the Motor Racing Association at 304 West Fifty-eighth street took place recently when a reception was held to the newly elected associate members of the association. The commodiousness and attractiveness of the club building was a decided surprise to the several hundred people who were present. These were welcomed by C. F. Wyckoff, president; E. R. Hollender, vice-president; Carl H. Page, treasurer, and W. C. Allen, secretary.

The building, an old brownstone mansion, has been fitted for club purposes and has every equipment and convenience to make a comfortable and attractive town house for those interested in speed competition or in the trade. On the main floor are located the offices of the M. R. A., a reception and a dining room. On the floor above are billiard and pool tables. Card and writing rooms occupy the third floor, while on the fourth floor are located several suites of sleeping apartments.



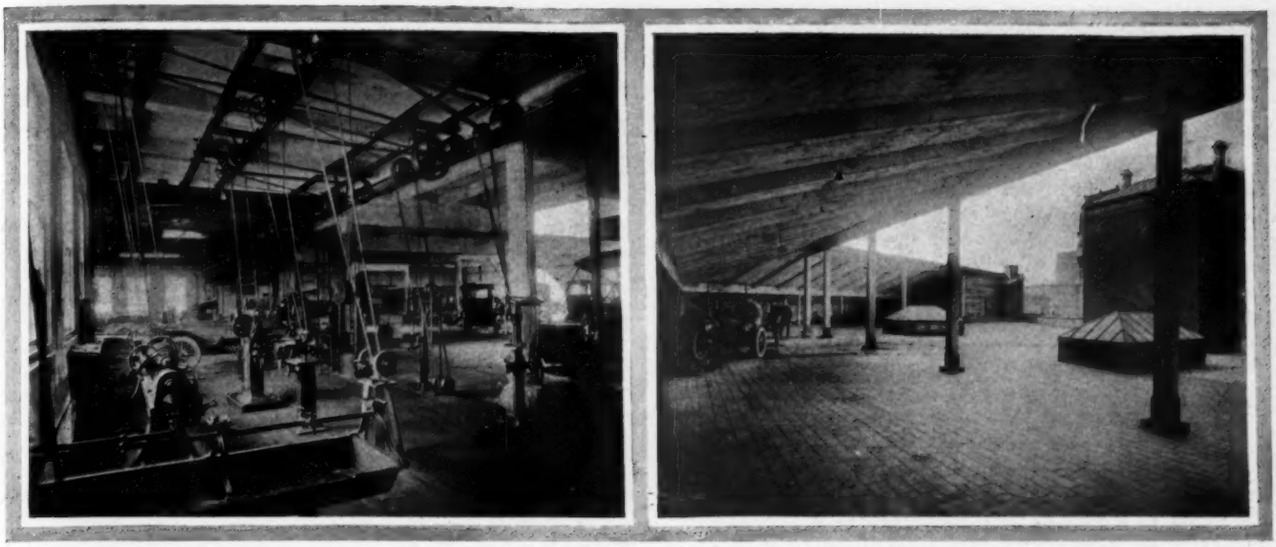
Seventieth Street Front of Winton Combined Office, Sales, and Garage Building, Showing Two Garage Entrances

Prominent New York City Garages—II—Winton

IN a city the size of New York there are many large garages which can do very well taking in but one class of or one make of cars, that is, the product of but one maker. In this class might be described the garage of the Winton Company, located well up in Automobile Row, at the northeast corner of Broadway and West Seventieth street. While other makes of car are not refused, it has just happened that the clientele of this garage numbers so many Winton owners as to take up all of the available space, and thus, the place has received the name of being exclusively a Winton garage, which of course, is not the case.

The garage part of the building—the Broadway front is utilized as a salesroom and offices for the New York Winton branch—is located on the entire second, third, and fourth floors of the building, the entire roof, and the Seventieth street front of the ground floor, there being no basement. The entrance is

View on Second Floor, Devoted to Live Storage. Also Third Floor, for Dead Storage



Fourth Floor Showing Machine Shop, Also Roof with Repair Work in Progress on Two Cars

on the Seventieth street side, through two twelve-foot doors, between which are located the garage offices and checker.

Driving straight in to the center of the building, the elevator is reached, which serves the floors above. The whole available space of the ground floor—necessarily small on account of leaving space from both the doors to the elevator—is used for live storage, as is also the whole second floor. Above that, the third floor is given up wholly to dead storage, while the fourth floor houses the repair shops, some dead storage, and when pressed for room, some cars on live storage also. Above this, the roof shows a unique feature, being finished off just like any of the lower floors, excepting only for the covering, which is but 25 or 30 feet wide around the south and west sides. Under this roofed part, are placed electric lights, while the elevator shaft carries up, that making of the roof an additional floor of full size in fair weather, and about half size during bad, cold, or inclement weather. At the time the pictures shown herewith were taken, this roof was being used for dismantling two cars, preparatory to spring overhauling and repairing.

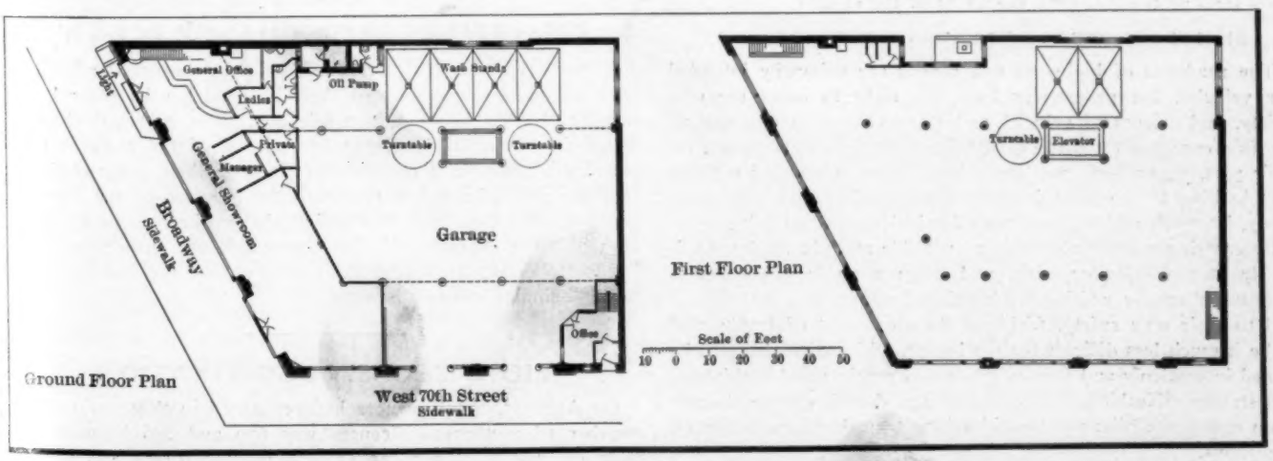
The building is comparatively new, having been built but three years ago, that is, in the fall of 1907, and like all modern buildings, is well equipped. Gasoline and oils are kept on the ground floor, a special room containing the latter, in barrel lots, while the former, is housed in a 400-gallon tank, in a separate room, of brick, and kept locked at all times.

The full capacity is said to be no less than 110 cars on live storage and 75 on dead storage, the whole capacity being slightly less than 200 cars, the present distribution being according to the figures given. To handle this number of cars, and handle them properly, about 50 to 55 men are employed, exclusive of sales and office employees, who are kept separate.

In the arrangement of the distribution of the cars, the vital point in a city garage where space is at a premium, the arrangement is good, consisting of the aforementioned elevator in the center of the building with turntables on each side of it on the ground floor, and on but one side on all other floors, except the roof, where there is no turntable. Not all of the turntables are in constant use, they being of an old pattern, but on the floors where they are in working order, the men find them a very useful adjunct, saving as they do much manual labor in pulling and hauling the cars around, as well as saving the tires.

On the ground floor are also located the lockers for chauffeurs, the rest or play room for the latter, as well as the washstands for the cars. On each of the upper floors, there is placed one or more additional washstands, so that the car may be washed and then taken to its proper floor, or taken up to the floor on which it belongs and washed there, just as circumstances would seem to indicate which course was best.

The machine shop is complete as garage machine shops go, and has in connection with it a very large stock room, containing not only repair parts for all model Winton cars, but also a good supply of standard parts, bolts and nuts, bar stock, and similar material, which would be necessary in the repair of any make of car.



Winton Garage—Ground Floor and Typical Higher Floor Plans, Showing Irregular Shape of Building

THE LAW OF THE ROAD

(*Continued from page 769.*)

RIGHT OF WAY

Police, fire department, fire patrol, traffic emergency repair, U. S. Mail vehicles and ambulances shall have the right of way in any street and through any procession.

Subject to Section I of this article, everything being equal, all vehicles and street cars going in a northerly or southerly direction shall have the right of way over all vehicles and street cars going in an easterly or westerly direction.

Subject to Section I of this article, street cars shall have the right of way between cross streets, over all other vehicles; and the driver of any vehicle, proceeding upon the track in front of a street car, shall immediately turn out upon signal by the motorman, driver or conductor of the car.

No vehicle or street car shall so occupy any street as to interfere with or interrupt the passage of other street cars or vehicles.

A vehicle waiting at the curb shall promptly give place to a vehicle about to take on or let off passengers.

The driver of a vehicle, on the approach of a fire engine or any other fire apparatus, shall immediately draw up said vehicle as near as practicable to the right-hand curb and parallel thereto and bring it to a standstill.

The driver of a street car shall immediately stop said car and keep it stationary upon the approach of a fire engine or other fire apparatus.

MAXIMUM SPEED

No vehicle shall proceed at any time at a greater speed than the law allows and is safe and proper under the conditions then obtaining.

No vehicle shall cross any street or avenue running north and south or make any turn at a speed rate exceeding one-half its legal speed limit.

OVERTAKING STREET CARS

A driver of a vehicle overtaking a street car shall exercise due caution not to interfere with or injure passengers getting on or off said car.

GENERAL PROVISIONS

No one shall drive a vehicle that is so covered in or constructed as to prevent the driver thereof from having a sufficient view of the traffic following and at the sides of such vehicle.

No one shall drive or conduct any vehicle in such condition, so constructed or so loaded as to be likely to cause delay in traffic or accident or injury to man, beast or property.

No one shall so load a vehicle, or drive a vehicle so loaded, with iron or other material that may strike together without its being properly "deafened" so as to cause no unnecessary noise.

No one shall ride upon the rear end of any vehicle without the consent of the driver, and when so riding no part of the person's body shall protrude beyond the limits of the vehicle.

RIGHTS AND DUTIES OF DRIVERS AND PEDESTRIANS

The roadbeds of highways and streets are primarily intended for vehicles, but pedestrians have the right to cross them in safety, and drivers of vehicles and street cars must exercise all possible care not to injure pedestrians. Pedestrians should, on their part, never step from the sidewalk to the roadbed without first looking to see what is approaching, and should not, needlessly, interfere with the passage of vehicles or street cars.

By crossing a street as nearly as possible at right angles, preferably at a regular crossing, and when a traffic policeman is stationed there, by waiting for his signal, pedestrians will greatly add to their own safety, facilitate the movement of traffic, and make it much less difficult for the horses, which often have to be reined in suddenly and painfully to avoid careless and unthinking pedestrians. Nothing in the foregoing should excuse drivers from constant vigilance to avoid injury to pedestrians under all conditions.

The word vehicle includes equestrians, led horses and everything on wheels or runners except street cars and baby carriages.

The word driver includes the rider and driver of a horse, the rider of wheels and the operator of a motor vehicle or street car.

OBEDIENCE

Drivers of vehicles and street cars must at all times comply with any direction by voice or hand of any member of the police force, as to stopping, starting, approaching or departing from any place; the manner of taking up or setting down passengers or loading goods in any place.

Ignorance of these rules shall furnish no excuse for disregarding them.

LEGAL RESULTS OF VIOLATING RULES OF THE ROAD

Before concluding it should be stated that a traveler who for any reason is on the wrong side of the road must exercise greater care to prevent a collision. N. Y. Trans. Co. vs. Garside, 85 C. C. A. 285; Pluckwell vs. Wilson, 5 Carrington & Payne (Eng.) 375; Fahrney vs. O'Donnell, 107, Ill., App. 608; Angell vs. Lewis, 20 R. I. 391. If a collision takes place, the presumption is against the person on the wrong side of the road. Angell vs. Lewis, 20 R. I. 391. In Perlstein vs. Am. Exp. Co., 177 Mass. 530, it was held that evidence that the plaintiff was driving on the right-hand side of the street close to the sidewalk, is evidence of due care on his part, and that the defendant was driving "very fast" in the opposite direction and collided with the plaintiff, was evidence of negligence on the part of the defendant. Traveling on the wrong side of the street while a collision occurs constitutes prima facie evidence of negligence. Angell vs. Lewis, 20 R. I. 391. See also Perlstein vs. Am. Exp. Co., 177 Mass. 530.

Criminal liability may also be incurred for violating certain rules of the road. In some States double and treble damages may be recovered.

TAXICAB IS NOT A LEGAL "CARRIAGE"

Boston, Apr. 18.—Holding that the taxicab is not a carriage under the provisions of the revised laws, the full bench of the Massachusetts Supreme Court has decided that it is not a criminal offense to refuse to pay a taxicab fare.

As a result the managers of the taxicab companies have prepared a petition to the Legislature asking it to take immediate action in amending the law so that they will be protected.

The decision was handed down in the case of the Commonwealth against James C. Goldman.

In the superior court, the defendant was found guilty of refusing to pay fare of $8.50 and appealed on the ground that the word carriage, as used in the statute, does not include automobiles. This contention, the full bench upholds.

CHAUFFEURS URGE CHANGE IN LAW

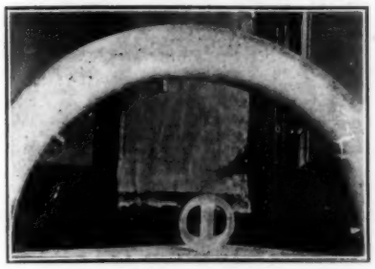
Boston, Apr. 18.—Private chauffeurs went before the Legislature this week in support of their bill which asks several important changes in the automobile law. The principal changes asked for are that chauffeurs be relieved of the obligation of wearing a badge in a conspicuous place on their outer clothing, that the part of the law requiring the blowing of the horn at every street intersection be nullified, that no licenses be suspended without a hearing and that the mandatory suspension of a license following an appeal from a conviction for reckless driving and similar offenses be dropped.

BIG WISCONSIN REGISTRATION

On April 15, 10,918 owners had registered in Wisconsin. The number of motorcycle licenses was 679 and 256 licenses had been granted to motor car dealers, manufacturers and motorcycle agents.

PROMINENT ACCESSORIES

The old problem of producing a puncture-proof automobile tire without reducing air space and the resiliency (which is the main purpose of a tire) too much, has found a new solution through the efforts of Dr. T. J. Cooper, of Paterson, N. J., who has produced the "Fear-Naught" tire shown in the accompanying illustration. Dr. Cooper is a veterinary surgeon, like Dunlop, the erstwhile inventor of the pneumatic tire, and has spent a good part of the past eight years in bringing his invention into practical shape, the difficulties lying mostly in perfecting manufacturing processes so as to reduce cost and weight to a minimum. It can now be made either as a plain single-tube tire to be fastened to the rim and prevented from creeping by means of metal studs projecting at intervals from the inner periphery, or provided with flanges of rubber and fabric for application to the universal clincher rim. A "Fear-Naught" tire of the latter type of 3⅛-inch diameter and adapted for a 30 by 3-inch rim weighs 22 pounds, while an ordinary clincher tire of 2⅞-inch diameter, adapted for the same rim, weighs 15 pounds. The difference is due mostly to the thick vertical web, made of rubber 50 degrees pure, which separates the air space in Dr. Cooper's tire into two parallel divisions, and to which are due the tire's non-collapsible and almost puncture-proof qualities.



View of Cooper Tire Showing Lugs

The tire is inflated through a single valve, from which the air duct forks Y-like through the vertical web, and the apertures to each of the air chambers are closed with one-way rubber flap valves admitting air during inflation but preventing one chamber from losing its inflation if the other should happen to become punctured. Even if both chambers are deflated, however, the tire still supports its load and no rim cutting takes place, as has been proved to users by severe and long-continued tests, especially in Paterson, where several automobiles have been fitted with these tires for four years. The inventor himself used one on a rear wheel of an automobile, and wore out three other pneumatic tires on the other rear wheel in competition with it. Dr. Cooper is negotiating with the Board of Trade of his home town with a view to arranging for the establishment of a manufacturing plant.

Section of Cooper Tire with Air Space

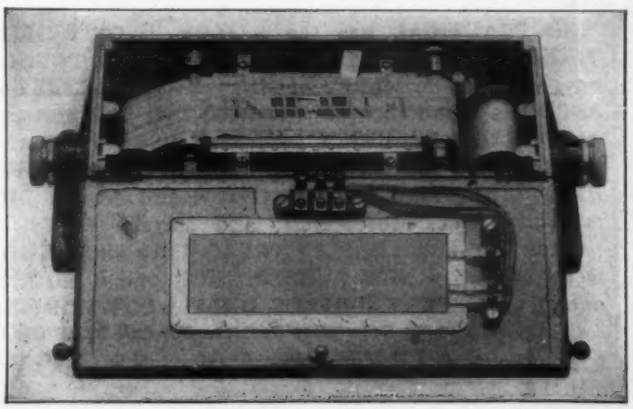
Carbon removal is at best a difficult job, and one that is never welcome to the amateur owner, nor to the professional chauffeur. So, it is with great relief that car owners and drivers are now turning to the various preparations on the market for doing this work, but doing it insidiously and quietly, without tearing down the engine. One of these decarbonizers is called by the makers, the Flash Manufacturing Company, Zanesville, Ohio, "Flash," from its very rapid action. This decarbonizer is a compound dissolvent in dry form, that is, a powder, which is placed in the cylinders, is aerated by the combustion, and the mephitic vapors given off check the formation of carbon, or if already there, loosen it from the cylinder or other walls, so that it is blown out through the exhaust pipes.

A new spark plug, the Blue Blaze, is that made and sold by the National Steel Products Company, Lorain, Ohio. The greatest features of this plug is that the lower or firing end is closed with the exception of a single very small diameter hole. The spark is thus made inside of the body of the plug, and passes out to the combustion chamber through the small hole. The result is that no soot or carbon can accumulate, the action being that of self-purification. So well has this worked in actual practice that a Blue Blaze plug has been known to run sixteen months without removal from the cylinder, to say nothing of cleaning. The plug is made with both porcelain and mica cores, the buyer being offered his choice.

A new watch for use in broughams, landaulets, and other closed cars is that of the New England Watch Company, Waterbury, Conn. As the illustration shows, the back of the watch snaps on, making the delicate mechanism of the inside dust and damp-proof. The watch is fitted to the toilet case by screwing the front or bevel to the flange, so that the watch and toilet case are the same as if made in one. The dial has heavy black figures and hands, making it an easy matter to read the time by means of it at any time of day or night. The movement is very high class, being fitted with a double-roller lever movement, seven jewels, Breguet hair spring, cut expansion balance, etc.

New England Watch Company's Limousine Watch

Since one's location on the road is fully as important as the speed, the time, or the condition of the road, a new device, herewith illustrated, should find favor with automobilists. This is a position indicator, which shows at all times the exact location of the machine upon the road which is being traveled. In appearance, it is a square wooden box about 6 in. high and wide by 10 in. long, which is fastened to the dashboard. On the upper glass face, a ribbon or map passes under a thread which indicates the automobile position. The map, corresponding to the route traveled, and being geared to the wheels, the correct position is always shown.



Hofmann Location Indicator, a New Device

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